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IN THE

GREAT PYRAMID OF JEEZEH IN EGYPT

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THE INTERNATIONAL INSTITUTE

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THE HISTORY OF THE GREAT PYRAMID.

II.

“AL MAMOUN'S FORCED HOLE.”

In the year 820, A. D., Al Mamoun, Caliph of Cairo, son of Haroun Al Raschid, Caliph of Bagdad, the hero of the Arabian Nights' Entertainments, determined to break a way into the interior of the Great Pyramid. He was a young man of more than ordinary ability, and ambitious to emulate the famous deeds of his father. He was urged on, too, by the *littérateurs* of his court, who described in all the extravagance of Oriental imagery the wonderful riches which were there. For instance one of their fancies was that this was the chief treasure house of the kings of the genii, and that such treasures as those found in Aladdin's cave would be found also in this vast edifice. Urged alike by his own ambition and by the gorgeous imaginings of his courtiers, he set about forcing his way to the rooms which contained these treasures, if indeed there were any rooms, and the treasures were therein contained.

By some means “a very indistinct rumor seems to have survived which led him to try the *northern* side.” But he had no real knowledge to guide him, and guessing the best he could,

he began exactly in the middle. This was twenty-five feet away to the west, and many more feet too low down, as the door was fifty feet up from the pavement. However, at it he went, with the vigor of youth and the blind drive of an absolute despot. For three months he had kept the work 'agoing with such rude implements as men then possessed, in which time they had penetrated about a hundred feet, and his wearied workmen "were almost becoming openly rebellious, when they heard, one day, a great stone fall evidently in some hollow space a few feet to one side of them. Instantly they pushed with all energy in the direction of the strange noise. Hammers, fire, and vinegar were employed, again and again, until breaking through a wall surface, they burst into the hollow way of the descending passage, 'exceeding dark, dreadful to look at, and difficult to pass.'"

The stone which had fallen, jarred down we may suppose by their blows, was the stopper or door to the ascending passage, which had been so placed by the builders as not to show in the least, but to seem just like all the rest of the ceiling of the descending passage. Hence all the upper rooms of the building were entirely unknown to the ancients. They only knew the descending passage, and the unfinished room in the depths below, quarried out in the solid rock. But the falling out of this stone disclosed to man for the first time since the builders left the Pyramid this passage going upward, straight to the south.

"But that ascending passage itself was still closed a little further up by an adamantine portcullis, or rather stopper, formed by a series of huge granite plugs of square wedge-like shape滑下, and then jammed in immovably from above. To break them to pieces within the confined entrance passage space, and pull out the fragments there, was entirely out of the question. So the grim Saracen Mussulmans broke a way sideways around to the west through the smaller ordinary masonry, and so up again (by a huge chasm still to be seen, and indeed still used by all who would enter the upper interior,) to the newly discovered ascending passage, at a point past the exceeding hardness of its lower granite obstruction. Beyond the

granite they still found the passage blocked, but only by limestone. So making themselves a very great hole in the masonry along the western side of the ascending passage at this point, they wielded their tools with energy on the long, fair blocks of limestone which presented themselves to view. But as fast as they broke one block into pieces, and cleared them out, other blocks slid down from above, each one just filling the body of the passage full. But the commander of the faithful held them to the work, long and weary as it was, until at length all the blocks were cleared out and the way upwards was open,—the way to all the hidden rooms, deep mysteries, and profound meanings of the building, the way which had been trodden by no foot of man since the builders closed it and departed. Forthwith along that way upward they rushed, Al Mamoun and his bearded crew, thirsting for the promised wealth. Up the low, narrow way of the steep incline for more than a hundred feet they crept one by one almost on hands and knees, with their torches burning low. Then suddenly they burst forth into that lofty, and altogether unique passage, the grand gallery. Then whooping and shouting and waving their torches, the dusky crowd rushed headlong up the far slope to the upper end ; clambered over the sharp, strange, stone step, three feet high ; scrambled through the short passage into the ante-chamber ; crawled under the strange granite leaf ; hastened on through another short passage, and came suddenly to that most noble room, the end of all their journey, and of all other men's journeys hitherto, the King's Chamber ; and there they stopped in dumb amazement, for they found that it contained no treasure except a lidless, empty, stone trough, only this and nothing more. There they stood, the dusky crowd, Al Mamoun and his band, in that most noble, exquisite, and finely furnished room man ever built, the supreme thought and care of the mighty edifice, but empty of all treasure they could know. Yes, there they stood, amazed, puzzled, defeated, confounded. They looked aloft, around, and at their feet, and all that those polished granite walls contained which they could see was only a lidless, empty stone trough, as meaningless and worthless to them as the bones of the dead. There it stood,

as it had stood for so many ages, never seen before by the eye of man since the builders had shut it in there ; nor meant to have been seen, till those men should come who were worthy of such mighty work, and who with keen and capable minds could discern the purpose, read the riddle, and disclose the thought which the ancients had uttered with such vast and pains-taking labor. Riches these bearded burglars sought ; and there stood this trough, smoothly and squarely cut, the most precious material object on the globe, save only the monument which contained it, absolutely more precious than the tinsel and glitter of all the jewelry of the world ; and yet utterly worthless to them. Yes, and there they stood in blank astonishment, at the end of their months of weary labor ; and had theirs been the Yankee way of utterance, there would have risen involuntarily to their lips the single syllable, SOLD !

But the men who had wrought the work in weary toil through all these months, held to their task by the iron hand of the Caliph, were not to be satisfied with a word. They must have their pay. So the tradition says Al Mamoun, to save appearances, caused a large sum of money to be buried secretly by night in a certain spot near the end of his own quarried-out way. Next day he directed the men to dig just there, and say they found the treasure. " And the Caliph ordered it to be counted, and lo ! it amounted to the exact sum that the work had cost, neither more nor less. And the Caliph was astonished, and said that he could not understand how the kings of the Pyramid of old, actually before the deluge, could have known exactly how much money he should have expended in his undertaking ; and he was lost in surprise." But the workmen got their pay, and so ceased their complaints and dispersed. As for the Caliph himself, he presently left Egypt for his more imperial residence in Bagdad, and Egypt and the Pyramid saw him no more again forever.*

JESSE H. JONES.

[*Condensed from C. Piazzi Smyth, who is our authority for this account.]

THE ALTAR AND PILLAR TO JEHOVAH.

II.

We have now seen that the altars to Jehovah in the land of Canaan were of two kinds, the altar of sacrifice and the altar of witness ; and that each, when built of stone, was composed of thirteen bowlders, representing the thirteen tribes of Israel in the land of Canaan, under the name of twelve ; and that the consequent form of the altar was a truncated pyramid. In so seeing, we have found that the altar of witness erected by Joshua in Gilgal was strikingly analogous to the altar erected by an ancestor of his "for a witness to Jehovah of Hosts in the land of Egypt ;" and as the stones of this altar, equally with those of the altar of sacrifice, symbolized the tribes of Israel in the land of Canaan, we may believe that the absent top-stone, by which, had it been present, the altar would have been a pyramid complete, symbolized the absence of a representative individual of the tribes of Israel, as a prophetic type destined to a glorious fulfillment in a representative *tribe* of the tribes of Israel, and still more in a representative of the tribes of universal humanity, the *Ecce Homo*. The sacrificial offering in the place of the top-stone of the altar of sacrifice prefigured the self-sacrifice of the Lamb of God for the redemption of his people, and therein for the salvation of all mankind, until his coming to judgment, when the altar of sacrifice will be transformed into an emblem of his universal Kingdom, like that on the reverse seal of the United States, and when the sacrifice will be replaced by the "chief corner stone," representing the Christ, the Living Head.

The mention of "an altar" as "a witness to Jehovah of Hosts in the land of Egypt," is followed by the statement that in that day the Egyptians "shall do sacrifice and oblation" ; but the fact that the Great Pyramid had once a pyramidion, a perfect representative of the pyramid as a whole, as well as polished casing-stones descending therefrom on every side to

the pavement, shows that it was erected as an altar of witness, rather than of sacrifice ; and what is that perfect representation of the Great Pyramid as a whole so likely to have symbolized as the royal arch-mason, the good shepherd Philiton ? Besides the fact that Joseph's brothers must have sold him to the Ishmaelites, and that these must have sold him to their Egyptian relatives, not as their own kith and kin, but as a Philistine, and that he thence very naturally took the name of "Philistis" or "Philiton," it is evident that Jacob's entire family, being brought down to Egypt by Philitis from Philistia, were naturally looked upon by the Egyptians as Philistines. Also, Joseph having introduced his people to the Pharaoh as "shepherds," and he himself being not only "ruler over all the land of Egypt," but "ruler of his brethren," (*Ecclesiasticus xl ix, 17,*) and these being not only patriarchal rulers of their tribes, but subject to Joseph in the rulership of his kingdom, Joseph was "a Shepherd King" of "Shepherd Kings." We see, therefore, that "the dynasty of Shepherd Kings" was no "Hyksos invasion," but was born and developed in Egypt, and continued its closure of the Egyptian temples and its suppression of idolatry for over a hundred years, not by physical force and political intrigue, but by moral and spiritual influences, pure and simple. The government of the shepherd kings in the land of Egypt, being a pastorate, was a Theocracy, and was revived in the land of Canaan under Moses, Joshua, the Judges, Samuel, David, and Solomon. And now comes the sequel of this brief history in the briefest language, quoted by Mrs. Piazzi Smyth in the *International Standard*, p. 350, respecting the pyramids of Jeezeh, from the diary of Colonel Howard Vyse : "An additional interest arose from the great probability that they were the works of the great Shepherd Kings, whose descendants, according to Manetho, after their expulsion from Egypt, under the denomination of Philistines, built in Syria *Jerusalem*," Joseph was himself a prototype of "the Shepherd, the stone of Israel?" This archetypal Shepherd gathers "the lost sheep of the house of Israel" first; then the "other sheep, who are not of this fold," namely, the lost sheep of the tribe of Joseph ; and finally, when "they shall

look on him whom they have pierced, and shall mourn for him as one mourneth for an only son," he will make the house of Judah "as he-goats before the flock" in the repossession of his seat of universal empire, in answer to the prayer of his father David, "Give ear, O Shepherd of Israel, thou that leadest Joseph like a flock: thou that dwellest between the cherubim, shine forth. Before Ephraim, and Benjamin, and Manasseh, stir up thy strength, and come and save us." (Ps. lxxx, 1.)

Let me say here what I ought to have thought and said in my previous article, that the "issue" to be born to Joseph after Ephraim and Manasseh, were probably so called because they were to be daughters, not sons; that this constitutes a still stronger reason for supposing their posterity to have remained in Egypt with their relatives on the mother's side of the house; but that they were none the less of the tribe of the Christ-like Joseph on that account, and that as such they were to be regarded, equally with the tribes of Ephraim and Manasseh, as of the tribes of Israel in their ultimate inheritance of the Holy Land. "The birth-right was Joseph's;" and which of the tribes could more rightfully share in the promised inheritance than his? When the tribe of Ephraim, in fulfillment of the prophecy of Jacob, had become chief of the tribes of the house of Israel, in Samaria, it ceased to feel for the oppressed tribe of Joseph that sympathy which was due from a brother to a sister tribe; and for this reason, *i.e.*, because they were "not grieved for the affliction of Joseph," the prophet Amos said: "Therefore now shall they go captive at the head of them that go captive, and the banquet of them that stretched themselves (on their beds of ivory at table) shall be removed." (Amos vi. 6, 7.). Many believe that from the land of their captivity the tribe of Ephraim found their way to what is now the island of Great Britain, and has now in its hands both Egypt and the Holy Land, to do with it what it will. Let the many who so believe consider the import of the prophecy: "Thus saith the Lord Jehovah, Behold, I will take the stick of Joseph, which is in the hand of Ephraim, and the tribes of Israel his fellows, and will put them with him, even with the stick of Judah, and

make them one stick, and they shall be one in mine hand," etc. (Ezek. xxxii, 16-28.)

Resting his head upon a stone, Jacob beheld, in prophetic vision, a stairway from earth to Heaven, with the angels of God ascending and descending upon it, and with God himself standing above it, saying unto him, "I am Jehovah, the God of Abraham thy father, and the God of Isaac: the land whereon thou liest, to thee will I give it, and to thy seed; and thy seed shall be as the dust of the earth; and thou shalt spread abroad to the west, and to the east, and to the north, and to the south; and in thee and in thy seed shall all the families of the earth be blessed. And behold, I am with thee, and will keep thee in all places whither thou goest, and will bring thee again into this land; for I will not leave thee until I have done that which I have spoken to thee of." (Gen. xxviii, 13-15).

Now Jacob's vision, was it not a prevision of the "altar to Jehovah in the midst of the land of Egypt," as a symbol of his prospective sons in their predestined spreading abroad to the four points of the compass on the four quarters of the globe? More especially, was it not a prevision of this altar as a symbol of the son who was to be the builder of it, and still more especially as a symbol of the one "Seed" who was to identify himself with the "seed as of many," that is to say, with those whom he will recognize as "Israelites indeed, in whom there is no guile?" I think so, because Herodotus says of the Great Pyramid, that it "was built in steps, battlementwise, or, according to others, altarwise." (*Rawlinson's Herodotus*, quoted by Rev. Jesse Jones in *International Standard*, p. 138.) On these altar stairs "the angels of God" were seen by Jacob "ascending and descending"; and the more especial "Seed of Abraham," in whom "all the nations of the earth" are to be more especially blessed, identifies himself with the people whom I suppose to have been represented in the altar to Jehovah in the land of Egypt, as well as in the altars to Jehovah in the land of Canaan; and to "an Israelite indeed," who recognized him as "the Son of God" and "the King of Israel," he said, "Hereafter ye shall see Heaven open, and the angels

of God ascending and descending on the Son of man." (John i, 51.) The vision of Jacob is to be repeated in the experience of his children to the extent to which they are able to recognize "the Son of man," "the Shepherd, the stone of Israel," "the faithful and true Witness," as the representative of his people Israel and of all mankind, in the "altar to Jehovah in the midst of the land of Egypt," "for a witness to Jehovah of Hosts in the land of Egypt."

In the "altarwise" construction of its four sides, the Great Pyramid was like the altar of whole stones, except that the steps were as much more level as quadrangular stones are more level than globular ones. Of the altar of whole stones God said to the children of Israel through Moses, "Neither shalt thou go up by steps upon mine altar, that thy nakedness be not discovered thereon." (Ex. xx, 26.) By disobedience to the divine command, man became mortal and discovered the shame of his nakedness at the same time, and was therefore unfit to ascend and descend the steps which the angels of God ascended and descended, and to stand on the top of that stairway whose apex reached to Heaven, where God stood. To prevent desecration of the altar of whole stones by the means referred to, the children of Israel were commanded to "plaster it with plaster"; and for the same purpose, I suppose, the architect of the altar to Jehovah in the land of Egypt crowned it with a microcosmic symbol of the architect of the cosmos, representing the Being whom Jacob saw standing in the place of it; and from this cap-stone of pure white marble to the rock on which the altar was founded, the architect clothed the battlemented sides with polished marble casing stones. "The upper portion of the Pyramid," as Herodotus says, "was finished first, then the middle, and finally the part that was lowest and nearest the ground."

That the like object was accomplished in the case of the altars of stone in the land of Canaan by filling the interstices of their sides with plaster, is evident from the 27th chapter of Deuteronomy, where Moses gives directions concerning the altar of sacrifice to be erected on Mount Ebal. The "whole stones" of which this altar was to

be constructed were to be "great stones," and were to be "plastered with plaster," so that the words of the law, which God commanded the children of Israel that day, could be "written upon them very plainly." The account of the erection of this altar, and of its inscription with the words of the law, in obedience to the command of God through Moses, is to be found in the latter part of the 8th chapter of Joshua. Only in connection with an inscription is it mentioned that the unhewn stones of the altar were to be "plastered with plaster," but in no other way than by plastering with mortar of some kind could the altar of stone have presented a level top for the reception of the sacrifice, in no other way could that sacred place have been made inaccessible by steps in the declivities of the structure, and in no other way could the "altar of stone" have been like the "altar of earth," which, to be substantial, needed to be made, at least externally, of tenacious clay, and could hardly have been covered with such plastic material without an evening and smoothing of its surfaces. The most natural idea of the "altar of earth" is that it was a small hillock, tumulus, or mound, converted into a miniature teocalli by a levelling of its top for the altar fire, and by an adjustment of its slant sides to the four winds of Heaven; and that clay and mortar were intimately associated in the work of shielding surfaces from the war of elements is evident from such passages as these: "He shall come upon princes as upon mortar, and as the potter treadeth clay." (Nahum iii, 14.) "Fortify thy stronghold; go into clay and tread the mortar." (Isa. xli, 25.)

The same idea of an encasement for protection and finish was exemplified in "the brazen altar," which was made of shittim wood, and called "brazen" from the plating of brass with which it was overlaid; and if the altar of stones was a truncated pyramid, as it must have been, it is altogether probable that the earthen and brazen altars were of the same shape. There is nothing in the description of the brazen altar to require us to believe that it was of a cubical figure, as the pictorial commentators of the present day represent it to have been. It was simply "four-square," like the New Jerusalem,—

four-square upon the ground, no doubt,—“five cubits long, and five cubits broad,” and “the height thereof was three cubits.” (Ex. xxvii, 1.) Taking this height to be vertical from the junction of the two transverse diameters, or from the center of the base, it requires only a good mathematical head to answer the question whether the proportions of the brazen altar were not the same as those of the altar of whole stones. I incline to think that they were, and to believe that the altar-character of the Great Pyramid will thus meet with a three-fold confirmation, that of the altar of earth coated with clay, that of the altar of stone “plastered with plaster,” and that of the altar of wood plated with brass.

The marble encasement of the altar to Jehovah in the midst of Egypt answered to the plaster encasement of the altar of whole stones, in preventing the desecration incident to going up by the altar stairs to the place of the feet of the Most High. Did it also answer to the plaster encasement in furnishing a smooth, white surface for the writing of God's law, representing its inscription on the heart of his people Israel? That there was an inscription of some sort on the Great Pyramid is testified to by Herodotus, who witnessed it with his own eyes. To the luxurious Egyptian priests it meant “radishes, onions, and garlicks,”—after which the Israelites longed in their lustng after the fleshpots of Egypt. To certain pyramid mathematicians it means, “degrees, minutes, and seconds,” in the shape of “onions, radishes, and garlicks.” (*International Standard* p. 142.) To pyramid devotees, whether mathematicians or not, it may come to mean, “HOLINESS TO JEHOVAH,” in the “one language and one speech” that preceded the confusion of tongues, which appears to have been retained by the descendants of the men who took no part in the building of the tower of Babel. Imagining this familiar Hebrew inscription on an altar to Jehovah in Egypt, under the eyes of learned Egyptians and classic Greeks, reminds us of the words of Paul, from his position “in the midst of Mars' Hill,” to the men of Athens: “As I passed by, and beheld your devotions, I found an altar with this inscription, ‘TO

THE UNKNOWN GOD.' Whom, therefore, ye ignorantly worship, him declare I unto you." (Acts xvii, 23.)

After all, of what avail to our exposition of Isaiah xix, 19, are all these resemblances of the Great Pyramid to the altar of whole stones, in face of the text, " And if thou wilt make me an altar of stone, thou shalt not build it of hewn stone ; for if thou lift up thy tool upon it, thou hast polluted it?" We can only answer this question satisfactorily by referring to the more literal translation in the marginal reading. Here we see that in place of " thou shalt not build it of hewn stone " we should read, " thou shalt not build them with hewing," and that the iron tool was simply not to be lifted up upon the altar itself in the process of constructing it. On what other principle can we account for the scrupulous care of the master-mason of the temple Teocalli, or house of God in Jerusalem, to have its stones hewn to their proper proportions and relations to each other at the distance of their native quarries from the places they were to occupy in the fulfillment of their architectural design? Supposing a like scrupulous care on the part of the architect of the Great Pyramid, which is masonry pure and simple, and to which the masonic mysteries attending the construction of Solomon's temple are most likely to have owed their origin, we may still maintain that the altar of hewn stone in the midst of the land of Egypt was an altar to Jehovah. And for the masonic exclusion of the sound of the hammer, as of something profane, from the work of its construction, what reason can be assigned other than the deference due from the wisest possible altar of hewn stones, in the land of proverbial culture and scientific attainment, to the simplest possible altar of whole stones, the Proto-Pyramid, the altar of Jehovah erected by Abel, Noah, Abraham, Isaac, and Jacob, and to be erected by the children of Israel, in the lands of their pilgrimage from the garden of Eden to the " city out of sight, whose builder and maker is God?" And the significance of the altar of whole stones, what else is it than the consecration of art, from its very incipiency, to Nature, in its cosmic relation to the order and harmony of the system of worlds by which it is surrounded, and in the devotion of humanity, from

its infancy, to the service of the great Architect of the universe and the divine Composer of the music of the spheres?

If Professor Piazzi Smyth be right in saying that the Great Pyramid is partly founded on an embankment composed of the chippings of its own stones, in order to give it a position farther northward than that which is afforded by the rock of Jeezeh alone, then the iron tool of the stone-mason was lifted upon it, making its stones too obviously the reverse of whole stones, and the argument in favor of its having been an altar to Jehovah is unsatisfactory. But Mr. W. M. Flinders Petrie says that no such embankment exists, and he could hardly make such an assertion in opposition to Professor Smyth without knowing whereof he affirms. It is remarkable, too, that the only tools described by him as having been employed in the formation of the coffer in the King's chamber, and probably, also, in the formation of all the other granite monoliths within and about the Great Pyramid, were jewels set in bronze, reminding us of crystal glaciers and the tooth of time, with the eternal revolutions of lapidary winds and waters, the instruments with which Nature quarries her adamantine fragments and converts them into whole stones for the pristine altar to Jehovah, and with which she makes known to man his filial obligation to carry out her intentions in artistic design and execution.

Now if the stone altar of sacrifice was "plastered with plaster," as we see it to have been in the case of the altar on Mount Ebal, it is likely that the stone altar of witness was made even on its top and slanting sides in the same way; and this becomes certain when we find that the two altars were indistinguishable except by the distinctive uses to which they were appropriated. A case in which the altar of witness was mistaken for the altar of sacrifice is narrated in the 22d chapter of Joshua. The thirteen tribes entered the land of Canaan at the time of harvest, when the fruits of the earth were to take the place of the manna from Heaven, and when "Jordan overflowed all his banks." After the feast of the passover, the fall of Jericho, the division of the land by lot, etc., etc., the tribes of Reuben and Gad and the half tribe of Manasseh re-

turned to their chosen inheritance in the land of Gilead, on the east side of Jordan, at a season of the year when the river admitted a passage without the necessity of a miracle. And "over against the land of Canaan, in the borders of Jordan, at the passage of the children of Israel," they built "an altar of testimony," in imitation of that which all Israel had built on the west side of the Jordan. Like the altar built of "great stones" on Mount Ebal, it was "a great altar to see to," and the jealous Israelites of the land of Canaan mistook it for an altar of sacrifice to the gods of their Chaldean ancestors, in rivalry of the altar of sacrifice on Mount Ebal for the worship of Jehovah. The reply of the two and a half tribes to the accusation of the ten and a half was a masterpiece of prolix and stately rebuttal, of which the gist was this: "God forbid that we should rebel against Jehovah, to turn this day from following Jehovah, to build an altar for burnt-offerings, for meat-offerings or for sacrifices, beside the altar of Jehovah our God that is before his tabernacle." But still more to our purpose is expressed in this, which they put in the mouth of their posterity in reply to the anticipated jealousy of the posterity of their brethren: "Behold the pattern of the altar of Jehovah, which our fathers made, not for burnt-offerings, nor for sacrifices, but for a witness between us and you that Jehovah is God." The historian ends with this summary statement of the distinctive character of the altar so easily mistaken for an altar of sacrifice: "And the children of Reuben and the children of Gad called the altar *Ed*: for it shall be a witness between us that Jehovah is God." The marginal reading says that the word "*Ed*" means "a witness."

So then we see that this "great altar to see to," of a "pattern" which the children of Israel have now lost sight of and are called upon to "behold," is a forcible reminder of the "altar to Jehovah in the midst of the land of Egypt," "for a witness to Jehovah of Hosts in the land of Egypt." To those who are inclined to look upon the Great Pyramid as a funeral pyre to the sun and moon and the hosts of Heaven, over the mortal remains of a "son of the sun" of whom Egypt was bereft, but as a funeral pyre divested of its literal flames and

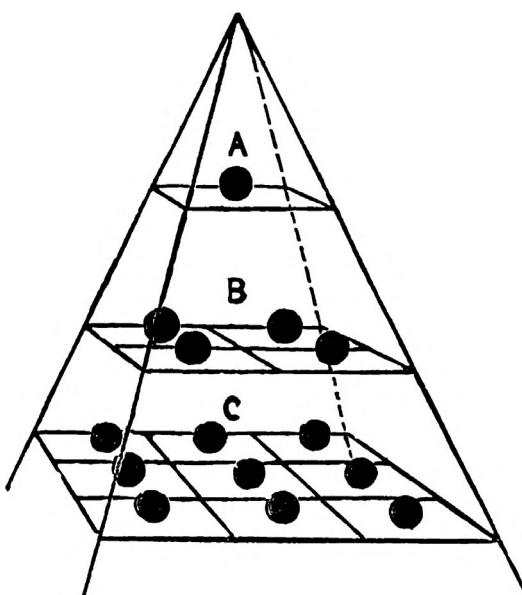
clouds of burning flesh by the scientific and artistic culture of the Egyptians, we may say of it in the precise language of the minority of Israel to the majority : " Behold the pattern of the altar of Jehovah, which our fathers made, not for burnt-offerings, nor for sacrifices, but for a witness between us and you that Jehovah is God."

But as the Great Pyramid is none the less highly mathematical and astronomical for being an altar of hewn stones, so the Proto-Pyramid is none the less highly mathematical and astronomical for being an altar of whole stones. The order and harmony of worlds, as well as of tribes, symbolized in the globular stones of the primeval altar to Jehovah, have already been referred to, and we may now speak briefly of their mathematical properties. To those who, with their "inheritance in the Great Pyramid," have inherited a fair share of the mathematical ability of the architect, (whose name means "Addition,") the numerical mysteries I am about to indicate will be as clear as sunlight, and the mountain of difficulty involved in the transition from the altar of whole stones to the altar of hewn stones, namely, the squaring of the circle, before Zerubbabel will become a plain. Of the latter I can say nothing, and of the former only this : That the number of bowlders of which the Proto-Pyramid was composed was either one, or five, or fourteen, or thirty, or fifty-five, or any number deducible from the same ratio of increase ; and that this ratio is from the head stone of the Pyramid downward and outward, like growth from the brain to the reproductive organs in man, and proceeds in the order of the odd numbers, one, three, five, seven, etc., in accordance with the square of all the numbers in succession, one, two, three, four, five, etc. For example : the one stone, in which was symbolized the Christ, rests upon four stones, three more than one, and the square of two ; the four stones, which may symbolize the four evangelists, rest upon nine stones, five more than four, and the square of three ; the nine stones, which may symbolize the disciples other than Matthew and John and exclusive of Judas, rest upon sixteen stones, seven more than nine and the square of four. The same ratio of increase goes on *ad infinitum*, as it well may in an altar

dedicated to the Being who is infinite and eternal, the Self-Exist-ent.

Here I am reminded, by a letter from a friend, (on another subject, however, and without any knowledge of what I am writing about,) that this ratio of increase in the Pyramid of whole stones is manifested also in some of the most interesting phenomena of nature. The Proto-Pyramid thus becomes the mediator of a correlation between Nature and Art of inestimable value to the artist, in every department of edification, especially in that of man, the noblest edifice in existence. And this fact naturally leads one to believe that the scientific as well as the religious teachings of the Great Pyramid are those of the Proto-Pyramid on a higher and more elaborate plane of development. On the subject of "Gravitation" the *Encyclopædia Britannica* says: "A body falling freely from rest moves over spaces proportional to the consecutive odd numbers (1, 3, 5, 7, etc.) in each of the consecutive seconds during which the motion lasts." Also: "A body falling freely from rest will, in a given number of seconds, move over a distance which is found by multiplying the square of the number of seconds by 16.1;" that is to say, by the distance fallen in one second. Moreover, the ordinary diagram explanatory of this principle is in admirable agreement with the Pyramid of whole stones in its growth from top to bottom, or from its least size to its greatest, in its periods of correspondence with what may be called the childhood and boyhood and maturity of the Christ in his kingdom. The distance measurement of the fall of a body by the force of gravity during a *single* unit of time is the square of ONE, or one square foot, we will say, of 144 square inches, representing in the base of the pyramidion the 144 square feet of the base of the Pyramid of twelve tiers, which I take the "great altar" on the east bank of the Jordan to have been, signifying the tribes of Israel as twelve; and on the square of one in the diagram I have placed a ball, to indicate the position of the chief corner stone of the Pyramid, representing the Christ. The distance measurement of the fall of a body by the force of gravity during *two* units of time is the square of two, ($2 \times 2 = 4$, 3 more than 1,); and on its four square

feet, as represented in the diagram, I have placed four balls, to indicate the four inferior corner stones of the Pyramid of five stones, or the four stones of the second tier of the Pyramid representing the tribes of Israel in their entirety. The distance measurement of the fall of a body by the force of gravity during *three* units of time is the square of THREE, ($3 \times 3 = 9$, 5 more than 4); and on the nine square feet of the diagram I have placed nine balls, to indicate the nine stones of the third and last tier of that pyramid which includes in its symbolization the tribe of Joseph, in distinction from the tribes of Ephraim and Manasseh, as most nearly related to "the Shepherd, the stone of Israel," that "leadeth Joseph like a flock."



The same ratio of increase pertains also to the force of the imponderables, that of radiation or diffusion, which is the opposite of gravitation, and which is manifested in the phenomena of light, heat, electricity, etc. The fire on the altar, kindled by the sun, or by the Being who is the fountain of truth and love as the sun is of light and heat, to whom ascended the grateful incense of the burnt-offering;—the hieroglyphic representation of the phœnix on her funeral pyre by a bird on the apex of a pyramid, symbolizing the transit of Venus across

the disc of the sun as the pyramidal means adopted by the Egyptians for ascertaining the solar parallax ;—the connection of the capstone of the Great Pyramid with the mystic “ A. O. R.” (*light*), which the cabalists have kept secret from the foundation of the world, but are about to proclaim from the house-tops ;—the fact that at mid-day, in mid-summer, the altar to Jehovah in the midst of the land of Egypt devours its own shadow, as effectually as if supervised by an eye-illumined pyramidion, like that of the pyramid on the reverse seal of the United States ;—all these, with many highly important passages of Scripture that might be cited, point to a correspondential relation between the Pyramid of whole stones and the earthward radiation of a luminary at its apex, in respect to the ratio of increase common to them both. In the light of these analogies between the phenomena of nature and the most pristine work of art, one can hardly fail to see a special reason in the mind of the architect of the Great Pyramid for expressing the proportion of the radius to the circumference of a circle in that of the vertical height of the Pyramid to the perimeter of its base, and to see in the wisdom of this wondrous structure an inspiration of the wisdom of the Great Architect of the Universe.

J. W. REDFIELD.

“THE FULNESS OF TIMES;” OR, THEOCRACY RESTORED.

A great many centuries ago a man, whom his neighbors laughed at and scorned, by turns, commenced to build a ship. I think he selected a place for his shipyard in the midst of a forest, on the crest of a gentle slope where nature had provided good drainage. On every side grew the cypress trees, of whose timber—gopher wood he called it—his ship was to be constructed. Abundant pasturage lay near at hand for his flocks and herds, and a never failing spring slaked the thirst of man and beast.

The builder had used good judgment and skill in selecting

his site, and in all his arrangements—except for the launching. Everybody but the builder could see that the “crank” who built the ship would never navigate it, unless he could sail it on dry land. But, in reply to all their scoffs, he constantly affirmed that though the ship might not be moved to the ocean, yet surely the ocean would come to the ship. And so when he had finished the building, he proceeded to equip and to take in the cargo ; and in the fulness of time the passengers went aboard and God closed the door, and sent the flood, and floated the ship, and saved its inmates, but drowned all the scoffers.

Year had followed year while the building of the ark was progressing ; the seasons had come and passed in regular succession ; everything in nature had seemed to continue as it was from the beginning, and the only changes perceptible were those which had been wrought by the hand of man ; the forest slowly disappearing, and the ark gradually assuming larger and more finished proportions. Not until the windows of heaven were open and the floods came, did men perceive that God had directed all that preparatory work ; and that those scoffers, who, for their daily bread, had labored for Noah, had all unconsciously worked for the fulfillment of God’s plans.

My friends, we are all more or less afflicted with a blindness which makes the daily routine of our lives often seem monotonous and aimless; yet, under the divine government, every man’s work is made to contribute its part toward the fulfillment of the prearranged purpose of the Almighty. And each purpose has its fulness of time, when the quiet preparatory work develops into startling results, and men are forced to admit, “This is God’s plan, not man’s.”

Considerably more than a thousand years pass away after the flood ; Abraham has lived and received the promise that from him should spring a great nation, and that the land in which he was a stranger should belong to his seed, and that in him should all the nations of the earth be blessed ; Isaac and Jacob have lived and died in this faith ; the bondage in Egypt, the forty years’ sojourn in the wilderness, the crossing of Jordan, and the occupation of the promised land, have followed in succession ; and now behold the last of the judges :

Samuel was old, "and his sons walked not in his ways." "Then all the elders of Israel gathered themselves together, and came to Samuel unto Ramah, and said unto him, Behold, thou art old, and thy sons walk not in thy ways ; now make us a king to judge us like all the nations. But the thing displeased Samuel, when they said, Give us a king to judge us. And Samuel prayed unto the Lord. And the Lord said unto Samuel, Hearken unto the voice of the people, in all that they say unto thee : for they have not rejected thee, but they have rejected me, that I should reign over them." [1st Samuel viii, 4-8].

And when Saul was anointed king, because the Israelites preferred to be like their heathen neighbors, the period of the theocracy was closed—yet not forever. Other centuries rolled away. Columbus had returned from that eventful voyage of discovery, and the united kingdoms of Castile and Aragon were thrilled with his story. The Spaniards, reckless of everything else in their greed for gold and their zeal for the papacy, eagerly manned the squadrons which their sovereigns equipped. Soon the natives of the West Indies were exterminated ; Mexican civilization was crushed, and Mexican gold and silver were quickly grasped ; the Peruvian Inca was seized by perfidy, and his vast wealth was confiscated.

The kings of Portugal and England and Holland and France sought to share with Spain the spoils to be found in the Western World, and continually intrigued and quarreled to wrest from each other the territories which each had seized.

Shortly before this time, the invention of the art of printing had opened the way for the spread of learning ; and, at about the same period, the Reformation brought light to men's souls, and transferred the allegiance of many from the corrupt papacy to the true God. All of these causes combined : the rapacity of kings, the discovery of a continent whose savage inhabitants could not withstand the firearms of European foes, the increase of intelligence, and the revival of primitive Christianity, led to the establishment, first of colonies, then of independent States, whose inhabitants, seeking liberty of conscience and a higher civilization, at length dared to deny the divine right of kin

and have lived and thrived, and proved to the whole world that "governments derive their just powers from the consent of the governed."

Consider, now, the position of our nation; we give allegiance to no earthly sovereign, but we are loyal to the King of kings; and, as a rule, we frame our laws in accordance with his commands. And if at any time our legislators enact a law which is contrary to the divine law, immediately on every hand the cry goes up, "Allegiance to higher law first;"—and agitation commences and never ceases until higher law prevails, though the path to victory may lie through an "irrepressible conflict," and a terrible war.

Note, then, this startling fact: Republicanism, tempered by Christianity, is theocracy restored—God's chosen form of government for his chosen people!

Are not the Anglo-Saxons a privileged race, a chosen people, that theocracy, once foolishly abandoned by the Israelites and for nearly thirty centuries withheld from mankind, should at last be bestowed upon us?—especially upon us of the United States of America; yet, also, in a great measure, upon the English, our kin;—for their monarchy is so limited that the people practically govern themselves.

May not this be the fulness of times foretold by Isaiah? (I.: 26.) "And I will restore thy judges as at the first, and thy counsellors as at the beginning." With David let us say: "The lines are fallen unto me in pleasant places; yea, I have a goodly heritage." The theocracy of ancient Israel is more than restored to the Anglo-Saxons of to-day.

But let us not be so elated with our good fortune as to abate our watchfulness. We are safe only while we continue loyal to Christianity. France tried republicanism without God, and "The Reign of Terror" was the result—a period so terrible that the people drew a breath of relief when Napoleon gave them despotism as a substitute. In her hour of madness, France undertook to overthrow every vestige of Christianity; and, that the Sabbath might be completely obliterated, she adopted a period of ten days in lieu of the week of seven days. Yet we may believe that her substitution of the decade for the

week was the result, quite as much, of an overweening pride which deified Reason, as of an exceeding madness against Christianity.

The same pride which so blasphemously undertook to improve upon the septenary grouping of days, by introducing the decimal, seems, in its calmer moments of self-conceit, to have elaborated the decimal metric system. So skilfully was that system devised, and so nicely concealed was its atheistic tendency, so apparently disconnected from the entire subject of religious belief, that it has almost carried the unsuspecting world by storm.

Previous to the invention of the metric system, the weights and measures of European nations were very discordant and confused, and trade and commerce were greatly embarrassed thereby. The French shrewdly judged that a system of weights, and linear, surface, and volume measures, all referable by decimal gradation to a single linear earth-commensurate standard, would be so clearly superior to anything then extant that all other nations would quickly adopt it; and they clearly foresaw that the universal adoption of French weights and measures would greatly facilitate the spread of French principles and French power. Nor were they greatly mistaken in their calculations; for although their famous metric system has not proved to be as scientifically perfect as was anticipated, yet, because it is a system, and is decimalsly related in all its parts, it has been adopted by the majority of civilized nations, and has a multitude of advocates in those nations which have not yet adopted it. And the spirit of self-sufficiency which ruled in France during the Revolution, and dared unaided to grapple every problem in civilization or science, rejecting the guidance of the Supreme Being, denying his interference with human affairs, and often denying his very existence;—this same spirit of self-sufficiency prompted the *savans* to devise, and their government to adopt an entirely new system of metrology, under the assumption that everything in the older systems, sacred or profane, must yield to the supremacy of modern science. And this spirit has seemed to make steady progress in the world from that day to this, and its growth has been strangely parallel with that of the metric

system. Already the majority of educated people affirm that science teaches the unchangeable nature of physical law so conclusively as to prove that God can never meddle with the natural course of events in answer to the prayers of Christians.

The campaign between rationalism and the childlike faith of primitive Christianity seems almost ready to be won by the rationalists. But suddenly a battery is unmasksed, and the rationalists will discover, too late for escape, that they are caught in the very snare which they have laid for Christianity. They have set up the metric system as the idol of modern science-worship, and suddenly the Ancient of Days confronts them with his system of metrology, which he placed on record 4,000 years ago in the Great Pyramid of Egypt, through the unconscious instrumentality of the Egyptians, under the rule of Cheops. History declares that, by some unaccountable means, this king was brought completely under the influence of certain Chaldean shepherds, who, says Prof. Richard A. Proctor, were worshipers of the true God; of the family of Terah, of which family came Abraham; and that under their direction Cheops built the Great Pyramid.

Late discoveries, whose details are yet incomplete, leave scarcely a doubt that this Pyramid is the "witness" concerning which Isaiah prophesied, "In that day shall there be an altar to the Lord in the midst of the land of Egypt, and a pillar at the border thereof to the Lord. And it shall be for a sign and for a witness unto the Lord of hosts in the land of Egypt." [Isa. xix, 19-20.]

Modern metrology demands an earth standard of reference for its measures; and takes, for that purpose, the quadrant of a meridian, of which there may be millions; but afterwards it discovers that different quadrants differ in length, in consequence of the irregular equatorial section of the earth.

Pyramid metrology took the earth's polar axis, of which there is but one, whose length is invariable.

Modern metrology attempts to take as its unit of measure the 1-10,000,000 of the quadrant of a meridian. But after the unit has been determined, and the standard platinum bar has been deposited in the government archives, an inaccuracy

in the survey is detected ;—and lo ! the metre is not exactly the 1-10,000,000 of the quadrant which was measured.

Pyramid metrology chose for its unit of measure the inch, which is not only earth-commensurate, but cosmic, inasmuch as it is an exact fractional part of the earth's diameter, which is the primary base line from which all celestial distances are calculated.

Modern metrology pleases the scientists, because it is exclusively a decimal system ; but discommodes and confuses the masses, because it is neither convenient, nor natural for their innumerable demands for various and rapid subdivision.

Pyramid metrology is adapted to every degree and calling in human life. It permits the largest range of subdivision, yet uses the decimal whenever that is most convenient.

The high science advocate of modern metrology boasts of the wonderful skill and knowledge by which he has recently corrected the calculations of the sun's distance.

The Pyramid astronomer recorded that distance correctly 4,000 years ago.

Modern metrology is confined to the mensuration of matter.

Pyramid metrology reaches beyond material things, and extends its scope to things spiritual and divine ; formulating, with mathematical precision, a record of the most momentous events of earth's history ; then future, but now in great part fulfilled.

Vain are the efforts of man, when he undertakes to contend with the Almighty ! In the fulness of times the divine purposes are established.

Our hereditary weights and measures, though greatly marred by ignorant, and sometimes presumptuous legislators, will yet throw off their disguise, and will sparkle forth in the primeval purity in which they came from the hand of their divine author ; and our Anglo-Saxon race, to whom has been committed the custody of these weights and measures, will acquire enough of the French shrewdness,—nay, rather of Heaven-inspired wisdom,—to perceive that the supremacy, or the fall, of our metrology portends the supremacy, or the fall of our principles and of our power.

The metric system must fall ; and rationalism and atheism,

which have been the companions of its rise, will go with it to destruction, "That in the dispensation of the fulness of times [God] might gather together in one all things in Christ, both which are in heaven and which are on earth, even in him, in whom also we have obtained an inheritance, being predestinated according to the purpose of him who worketh all things after the counsel of his own will." [Eph. i: 10, 11.]

J. H. Dow.

*THE ANNUAL ADDRESS OF THE PRESIDENT OF THE INTERNATIONAL INSTITUTE.

Four years ago, at this hour, on this anniversary day, Nov. 8th, at noon, was organized the Society which is now assembled here. The beginning was humble—few in number—only three present, all now here. To-day we number five hundred, and represent nearly all of the States of the Union, and England, Scotland, Ireland and France. We again meet in this place with an earnest and unflinching purpose to move forward in our work of investigation until we prove to those of our people who are running after new theories the falsity of the new system of weights and measures called the Metric or Decimal System, propounded by the French School of Atheists, of 1795; and until we prove to the whole world the superior origin and excellence of the Anglo-Saxon units of weights and measures handed down from age to age, which our forefathers were sworn to protect, and which we, their children, have met to defend.

One of the strangest things of to-day is the willingness of some so-called advanced thinkers and their blind followers to give up that which we have inherited from the remotest age without even an inquiry as to the value or antiquity of the inheritance, and to adopt a new system not yet one hundred years old, of which many of them are almost equally ignorant.

*Delivered before the International Institute for Preserving and Perfecting the Anglo-Saxon Weights and Measures, Boston, Mass., November, 1883.

Now no good citizen should allow another to vote away or take away his birthright, and no person can be called a good citizen who should permit the overthrow of the system of weights and measures which has been handed down to him from generations unknown without investigation into their origin and value. Such, however, were Great Britain and this Nation near doing just at the time when this Society began its existence.

The very able and intelligent Society of Civil Engineers of the city of Boston four years ago passed a resolution asking Congress that the French Metric System might be made compulsory in this country. The American Society was also moved upon—also the Western Society; and the curious part of it was that a very select and extremely small minority of these societies were about to capture the majorities unawares. But I wish you to observe how quiet these French Metric advocates have been lately; nevertheless, although quiet, do not for a moment suppose that they have given up their object; they are yet working most assiduously, and I may say also insidiously, to accomplish their object. And so let us not deceive ourselves by thinking that they will not return to the attack.

Nine thousand petitions were sent out asking the people of the different States to petition Congress not to change our units of weights and measures, and the Legislature of Ohio almost unanimously signed a petition to Congress asking that the French System should not be adopted: and although the late chairman of the Committee of Weights and Measures of the House of Representatives, Alexander Stephens, worked with all of his power to get the French Metric System introduced compulsorily, undoubtedly the influence of our Society utterly negatived his action and that of his coadjutors.

Certain advanced thinkers of the age say that our Society is blocking the wheels of progress. I should deeply regret to be ever rightfully accused of such a thing, for I desire always to be on the side of right; for that is always the winning side in the end, and on that side do I believe that we stand to-day. But the trouble with these so-called advanced thinkers is that they will not listen for a moment to anything in relation to the weights and measures of their forefathers, but without investigation

declare that they are the result of "accident or caprice" (Barnard). In this they do greatly err, and we would convince them of their error if they would but listen. The Pyramid, which I, with many others, believe is a symbol of the earth, and contains the system of weights and measures for us, and infinitely much more is much of an eye-sore to them, and a stumbling-block; hence they would fain ridicule the Society, which has for its seal a stone with so many corners. And one of them has made new measurements of the monument which we hold as the symbol of our chosen land, and as the embodiment of what was known of our ancient system of weights and measures, and of astronomy, of which we hold, in the little British inch, the key; and the measurer, Mr. Flinders Petrie, makes light of the theories of Piazzi Smyth, of the measures of the French savans, of Howard Vyse and others, and tells us that an American whom he met in Egypt, after hearing from Mr. Petrie of these new measures, said "he felt as if he had been to a funeral," thereby meaning that the teachings of the great stone pillar in Egypt were all brushed away. But there is more in that stone than was ever dreamt of in his philosophy.

I will not stop here to tell how Mr. Petrie has failed. I will make it the subject of a few special remarks at another time. We thank him for his accurate work. You will want to know what the Society has accomplished during the year. This is the important question.

The work has been done principally in Cleveland, Ohio, as my duties, other than those of the President of this Society, have been there; and I have given almost every moment of my time, outside of my railroad duties, to the Society.

The only meetings for business have been held in that city; and not only have the meetings been held every two weeks, with but one exception (on the Fourth of July), during the whole year, but for the past four years meetings have been held at a regular rented headquarters every two weeks, with very few exceptions, and the interest in the Society is not only unabated, but increasing. I have been present at all of these meetings, except when railroad duties called me elsewhere, and

have yet to attend one which could be called an uninteresting one, and with but one or two exceptions the sittings have lasted until 10 o'clock at night, and the audiences have been slow to go.

In Cleveland we have a large, commodious room in a beautiful building, well furnished with maps, charts and scales, with a very good library, and are gradually accumulating valuable things connected with our particular work. Here is a nucleus for the State. It has, to the present time, been a nucleus for the whole Institute, for there has been no abiding place for the Institute in any other State. The State organization in Boston has not been as strong as it should have been, hence the work it has done has been very feeble. I trust at this time it may commence a new life, and meet together at regular periods, not less than once a month, and probably not less than once in two weeks, in order that the subjects that naturally belong to this question may be discussed. The secretary of the Institute had resided, up to a short time previous to the last annual meeting, in Cleveland, but felt it to be his duty to go to Boston to stir up interest in that city, which we have felt inclined to regard as the real headquarters of the Institute, as we started it here.

At Cleveland, the only place where meetings have been regularly held, there have been presented during the last year forty-four papers upon various subjects connected with our work. Among the most prominent are the following list of papers read before the Ohio Auxiliary Society during the year ending November 8th, 1883:

November 8, 1882.—Unification of Moneys, Weights and Measures.—Alfred B. Taylor, Philadelphia, Pa.

November 8, 1882.—President's Annual Report.—Charles Latimer, Cleveland, O.

November 8, 1882.—Origin of the British Inch.—Rev. H. G. Wood, Sharon, Pa.

November 8, 1882.—Coffer in the King's Chamber of the Great Pyramid.—Charles Latimer, Cleveland, O.

November 8, 1882.—Taurian Myth.—Edward Fish, Chicago, Ill.

November 8, 1882.—"The Situation."—H. C. Thompson, Cleveland, O.

November 22, 1882.—The Origin of the word "Geometry."—Dr. E. M. Epstein, Vermillion, Da.

November 22, 1882.—The proposed Metric System.—Jacob M. Clark, New York.

December 6, 1882.—Criticism of Messrs. Dow and Latimer's Papers.—Joseph Baxendell, Southport, England.

December 6, 1882.—The King's Chamber.—William H. Searles, C E., Member American Society of Civil Engineers, Cleveland, O.

December 6, 1882.—Paper in Reply to Criticisms by Joseph Baxendell.—J. H. Dow, Cleveland, O.

December 6, 1882.—The Great Comet of 1882.—Prof. C. Piazzi Smyth, Astronomer Royal for Scotland.

December 20, 1882.—Conclusion of Paper on King's Chamber.—William H. Searles.

December 20, 1882.—Translation of Abbe Moigno's Preface to the Campaign of Moses.—Mrs. Emily Lewis, Philadelphia, Pa.

January 3, 1883.—Pyramid Scoffings by Proctor.—Prof. C. Piazzi Smyth. A. R. for Scotland.

January 3, 1883.—Paper in answer to question, "Is there any satisfactory reason for abandoning Weights and Measures and adopting the French system?"—G. C. Davies, Cleveland, O.

January 17, 1883.—Memoir of Rev. Joseph Goods, Author and Pyramid Student.—Prof. C. Piazzi Smyth.

January 17, 1883.—International Weights and Measures.—G. C. Davies, Cleveland, O.

January 31, 1883.—Interview with City Druggists.—Charles Latimer, Cleveland, O.

January 31, 1883.—The Metric System.—Dr. Watson Fell Quinby, Wilmington, Del.

February 14, 1883.—Discussion General.

February 28, 1883.—The Wire Gauge.—G. C. Davies, Cleveland, O.

March 14, 1883.—Metric Analogues.—Jacob M. Clark, New York.

March 14, 1883.—Bible Truth and The Great Pyramid.—John Chapman, Sheffield, England.

March 28, 1883.—A Memoir of Sir Henry Boucher Wrey.—Mrs. C. Piazzi Smyth.

March 28, 1883.—Coming Great Events.—J. L. Damphier, Canada.

April 11, 1883.—Knowledge of Pyramid Builders of Latitude and Longitude.—Joseph Baxendell, F. R. A. S., Southport, England.

April 25, 1883.—The Great Pyramid as a Standard of Weights and Measures.—Mrs. A. M. Searles, Cleveland, Ohio.

May 9, 1883.—The Cycloid and the Pyramid.—Rev. H. G. Wood, Sharon, Pa.

May 23, 1883.—Memoir of Prof. John Greaves.—Mrs. C. Piazzi Smyth.

May 23, 1883.—Discussion on Weights and Measures.—Frederick Brooks, Boston for the metre and Jacob M. Clark, New York against it.

June 9, 1883.—Discussions—New Pharmacopœia—General.

June 20, 1883.—The Shape of the Earth, an Epicycloidal.—Rev. H. G. Wood, Sharon, Pa.

June 20, 1883.—The Pyramid gives a Map of the Heavens.—Samuel Beswick, C. E., Strathroy, Canada.

July 18, 1883.—Units of Measure for Scientific Men.—Lewis d' A. Jackson, London, England.

July 18, 1883.—Russian Measures in the Pyramid.—Joseph Baxendell, Southport, England.

No meeting July 4th.

August 1, 1883.—The Earth's Elliptic Ratio in the Pyramid.—Samuel Beswick, C. E., Strathroy, Canada.

August 1, 1883.—Discussion—Merits of the Metric System.—Prof. R. A. Withouse writing in favor of—and Lorenzo Hale against.

August 15, 1883.—Chinese Measures.—Prof. John N. Stockwell, Astronomer, Cleveland, O.

August 15, 1883.—Lunation 4000 years ago.—Prof. John N. Stockwell, Astronomer, Cleveland, O.

August 29, 1883.—Standard Time.—Rev. H. G. Wood, Sharon, Pa.

September 12, 1883.—Remarks on Mr. Dow's reply to Mr. Baxendell's criticism of Mr

Dow's Paper—Length of Pendulum vibrating seconds and Time Length of Pyramid Inch—The original length of the British Inch and its relation to the Pyramid Inch.—Joseph Baxendell—paper divided in three parts.

September 12, 1883.—Reply to Prof. Proctor's article "Pyramid Prophecies and Egyptian Events."—Charles Casey, C. E., Pollerton Castle, Carlow, Ireland.

September 26, 1883.—Granite Leaf.—William H. Searles, Cleveland, O.

October 10, 1883.—Why Anglo Saxon Metrology should not be abandoned.—Lieut' C. A. L. Totten, U. S. A. Garden City, New York.

October 24, 1883.—No papers read.

One of the most important of these papers, the report of the Chairman on Standard Time and Prime Meridian, will be read at this meeting. The committee is composed of Prof. C. Piazzi Smyth, Astronomer Royal for Scotland; M. l'Abbé Moigno, editor of the *Cosmos*, Paris; Sanford Fleming, C. E., Canada, Commodore W. B. Whiting, U. S. N., W. H. Searles, C. E., Professor Stockwell, Astronomer; Charles Latimer and Rev. H. G. Wood.

Previous to this year whatever papers have been presented or written for the Society were published in pamphlet form or in the proceedings at the end of the year; but after a full discussion of this matter from time to time in the Society and among the members throughout the country it was considered important to the stability and to the progress of the Institute to publish a regular magazine or organ of the society in order to establish a nucleus around which all could rally. The question of the means was the principal one—how could such a magazine be made to pay—where could the members be found at once to float such a work. Leaving that subject for the present it was determined to issue an International Standard—a Magazine devoted to the Preservation of the Anglo-Saxon Weights and Measures and the Dissemination of the Wisdom contained in the Great Pyramid of Jeezeh, fully believing that it was God's work and that he would provide the means to carry it on—the money having been immediately provided for the first two numbers, and a sufficient backing to give an earnest of success for the year of one subscription. We are thankful to say that we have now put forth five numbers of our bimonthly Magazine, and that we want but one more number to make the full volume of a year, and we feel that there will be means to carry us safely through this year. We have faith to believe that the earnest

men and women who have taken hold of this matter will not see it die, but they will aid it by securing sufficient means to carry it through, and to provide a competent editor to secure a creditable work.

Since the Magazine has been started we have had abundant encouragement to show that we have done the right thing, and the subscriptions have increased until at present our membership and subscribers are something over five hundred.

It may be well said that this is but a very small number; but when it is considered that there has been no advertising, and that we have altogether depended upon the exertions of the members—and that is without extraordinary exertions—certainly we may feel well pleased with the advancement we have made; but I earnestly entreat you all to give some portion of your time at once, not only to publish as far as you are able the existence of this Magazine, but also to gather in worthy members from all parts of the country.

In regard to membership, I would advise each one to be careful that all persons presented for membership are worthy persons. We do not wish to exclude any, but it is important that we take such persons as are positively known to some of the members, or to the country, or to the community, in order that we should not have in our membership those who are not interested in our work.

However, all should be thankfully accepted as subscribers to the Magazine, as is the case with any other periodical; but I beg that none shall be so overweeningly anxious to get members as to bring in numbers of persons without their desire to become members, and without their proffer of the fee entitling them to membership; for in many cases persons have been thus accepted and have not acted with the Society. Such persons are a dead weight to the Society. I would not exclude any worthy poor man who is unable to pay as a member, but certainly no one should be entered as a member who has not expressed his desire to become one, either by solicitation or by his own voluntary act.

Another thing in regard to membership. There has been a distinction made heretofore between Institute members and

Auxiliary Society members. Such was the intention in the beginning of the organization, but it is very plain that all members of any of the societies of whatever State should be recognized as members of the Institute. It is quite evident that there is not enough means to keep up two organizations. A State organization should keep up itself. If a State society is not organized, then the members of that State should belong to the Institute. When the number of persons in a State who wish to belong to these societies has become sufficiently large to organize, say not less than twenty persons, then that State should be organized as an Auxiliary Society, yet all members of it having the same privileges in the Institute itself.

It has been our object from the beginning to have an organization in each State, but, so far, organization has only existed in the State of Ohio in any strength.

It becomes important to know how the organizations should be supported in different States. It is very plain that if the Magazine has enough supporters to employ an editor and to pay for its issue the nucleus of the Society is then formed upon a solid basis. This we hope has now been done and that subscribers will come in until the Magazine is self-supporting.

It may be asked, how has the Magazine been supported up to the present time? An examination of the treasurer's report of the Institute and of the Ohio Society will give an answer to this question. And right here I desire to state that the membership has not supported the Society, nor sustained the Magazine during the past year. The donations and receipts for subscriptions and membership to the International have been \$1,648.69; donations and membership and subscriptions to the Ohio Society, \$735.97. There have been \$2,341.90 expended, \$137.50 for room, \$1,543.12 for printing, \$401.50 for salaries. I need not say to you that the question of how this money should be raised for carrying on this work has been to me, not only a subject of very earnest thought but constant prayer; for I have never failed to believe that our work was of God.

At a time when it seemed as if there was no money to be obtained from any quarter, and that our object would fail for the want of means, it was my fortune to find a coal mine, the

proceeds of which I have devoted to this work of ours. When the Western Society of Engineers at Chicago had determined to ask Congress to make it compulsory for all people to use the French Metric System, I combatted them, and was the means, I believe, of preventing the passage of that measure. The gentleman who was the leader in that, as he thought, *great* movement, was not very well disposed towards me, and at a meeting, he subsequently ridiculed me by saying that the opposition to the French metric system came from one who was a believer in that old superstition of the power of the divining rod. I do not desire to make any boasts, or to exult over him, or to make a parade of the facts, but I only wish to inform him and all that the means to defeat the metric system have come through the influence and work of that rod—that the mine in which I am now interested was found by that rod. On the morning of the day that General Garfield was shot I was paid \$5,000 for advanced royalty in my interest in the mine. That money has been religiously devoted to the work of this Society ; and when that advanced royalty is worked out, which I trust will be within the next three months,, I expect to devote the proceeds of the remainder of the mine to the same purpose ; but, as I can only go step by step and not anticipate, I can only say that I am sure of \$5,000 which has been spent in this work faithfully ; \$940.90 last year and \$1,313.52 this year, beyond the receipts of the Society. I do not wish any one to consider that I have done anything more than my duty ; for the money was a gift outside of my regular work, coming from an earnest aspiration for you and for me and for all. The money has come from our mother earth. Only I trust it will have none other effect than to make each one of the Society feel the importance of an object which could have induced me to devote this money to the preservation of our weights and measures—a work which I hold sacred, as the kings of Egypt, in days past, swore upon the altar of Isis to preserve the calendar and the weights and measures of the race.

I have felt it my duty to explain this matter to you without pride or vainglory, that you may understand it.

The Magazine is a vehicle for all of the thoughts of all the

membership of the country, and the work of the Society is not the work of this country alone, nor of any other one country, but it is the work of the whole race; for there is nothing under heaven more important in our secular affairs than that we should have a just weight and measure; and it is our especial duty to see that that which has been handed down to us from generation to generation is not cast away without a thorough investigation and understanding of what we do. We implore you to investigate. If, after investigation of this subject, you find that our weights and measures have been the result of "accident or caprice," then any others, founded upon true scientific principles, are certainly better; but if it be found that our weights and measures are founded upon eternal truth, and are undoubtedly correlated with time and space, with the earth upon which we live, and with the universe of which we are a part, surely it is the part of wisdom for us to maintain them. We ask you, therefore, as good men, women, citizens, to study, investigate and conclude, in an earnest, rational, sober and sensible way, and not throw away that of which you are scientifically ignorant, to accept another which is certainly wrong in principle, not founded upon a scientific basis, as was first thought, but really upon an absolute error.

The Committee on Weights and Measures have not all reported. Several of them have promised to report. Those who have reported are the following: Alfred Taylor, S. F. Gates and myself. But as one of the committee aptly remarks, to determine upon a new system of weights and measures, or even to perfect our own upon our own units, would be a difficult task, inasmuch as the relation of capacity to weight is not correlative.

Sir John Herschel proposed to make the inch one thousandth longer, making it agree exactly, so far as the measures are known, with the 500 millionth of the earth's axis, and to make one cubic foot of distilled water at 62° Fahr. one thousand ounces. This would be all that is desired; but to the change of even one thousandth of an inch there seem to be insuperable obstacles. Certain it is that the British inch, as it is at present, agrees with the circle of 360°, as shown in the King's

Chamber of the Great Pyramid and in the coffer; and it agrees likewise with the earth's measurement of the parallel of latitude of 30° , in which the Great Pyramid is placed. These conclusions seem correct, however much the measures of the parts of the Pyramid may be made to vary in the infinitesimal parts in the different measures. The question of the intention of the architect is fixed, and cannot be moved by any new measures or any new measurer; and I doubt if it be necessary to make any change whatever in our units of weight and measure when the proper correlation between measure and weight shall be clearly understood, but they will be found commensurable with the earth in a certain and satisfactory degree, superior, by far, to the measures of the meridian through Paris by the French, which they variously supposed was *the* meridian of the world—in fact, perfect.

We have not much farther to seek, and it will be very plain how to improve and perfect our system of weights and measures, but we should not go to the French metre for it. We have all in our own Anglo-Saxon weights and measures to build upon and these will become the units of the world.

No, the language of the world is rapidly becoming Anglo-Saxon, the commerce of the world is controlled by Anglo-Saxons, and the French metric system will go down as certainly under the extension of the English language upon the earth, even in France itself.

It will be necessary to nominate at this meeting an executive committee—a committee on Standard Time and a committee on Weights and Measures;—also three trustees to hold and invest any funds or bequests for the Society which may be made; also the other officers and committees.

As this Society has not yet a fund provided for the payment of any salaries, it should be especially provided here that no officer of this Institute shall hold the Society responsible for any salary for services until a fund for the purpose shall be provided; and that no officer or member of the Institute shall have power to make a bill or contract a debt in the name of the Society unless the means shall already have been provided or guaranteed for the payment thereof.

— This resolution was passed at a regular meeting and convention at Cleveland—That the *International Standard* shall be the organ of the Society, and that it is unadvisable at this time to publish any other periodical in the name of the Institute.

These things are important, especially as we are gathering in members from all parts of the civilized world who should know the financial status. I am happy to state to you that the Society does not owe a cent and has a small balance on hand.

The officers of the Institute should be elected by letter ballot—either for one year or more, and blanks should be sent out for the purpose with the name proposed at the convention.

As at this convention it becomes a question of organizing under a charter of the State of Massachusetts, whereas heretofore the organization has been running without charter, the question must be settled with prudence and wisdom.

Although the State organization in Boston has accomplished but little, yet we must give our worthy secretary credit for bringing the work of the Institute before thousands of our people, by the exhibition of a model of the Pyramid, and the circulation of papers, pamphlets and magazines at the Foreign Exhibition; and we have reason to feel proud that our work has been so nobly recognized by the prominence it has received at one of the most remarkable exhibitions of foreign products known to history.

It has been suggested by many that our Society should send a commission to Egypt to make a careful examination of the Great Pyramid and settle all questions now in dispute, and make a more extended excavation and clearance of rubbish. This would be a grand work, and all the members should strive to bring it about.

Hoping that we shall be prospered in the next year as in the past, and thankful for our success, we ask your earnest co-operation, invoking God's blessing upon our work.

CHARLES LATIMER.

***REPORT OF THE CHAIRMAN OF THE COMMITTEE
ON WEIGHTS AND MEASURES.**

To design a system of weights and measures, which shall fulfill all the requirements of our present civilization, seems a task so simple that it is strange so much can be said about the subject and so little accomplished.

If we were without weights and measures, and had our present knowledge of the requirements of the age for them, any one of us could, in a few hours at most, prepare the schedule of a system, which would be faultless as to symmetry, practicable in its proportions, and convenient in its application to the wants of mankind, whether for the purposes of the scientist, the artisan or the tradesman.

In the production of such a system, we might adopt any arbitrary standard for a unit. It might be the length of a man's foot or the breadth of his thumb-nail, or the length of his arm; it might be the earth's circumference, or a quadrant of it, divided decimally; it might be the earth's polar or equatorial diameter similarly divided; or it might be a pendulum beating seconds or tenths of seconds at the equatorial sea level. But whichever of these were adopted (always bearing in mind that from neither, by any possibility, could the unit be reproduced), the result would be the same—we should have a perfectly systematic system—one in which the progression of quantities exactly corresponded with the numerical notation by which we expressed them, and one in which the standard units of the different kinds should be correlated in such a manner that one should be derived from another by some well defined law.

Unfortunately, no such arrangement now exists. It is presumable that the "French metric system" was originally intended to be so, but the same perversity which induced its originators to destroy its decimal symmetry by making its foun-

*A paper read before the Ohio Auxiliary Society for Preserving and Perfecting the Anglo-Saxon Weights and Measures, Wednesday, December 5, 1883.

dation a *quadrant* of the meridian, also induced them to make the unit of length one hundred times greater than that of weight, and that of capacity one thousand times greater. It is therefore patent that we cannot look to it for that ideal perfection so necessary to win people from long-established customs.

It is not my purpose to enter into the history of our metrology. Whatever may have been its origin, it is certain that during the history of this nation very little, if any, change has taken place in the value of its units. It is also certain that their values have been determined with the utmost precision, that duplicates of them can be produced with the greatest accuracy, and that all of the vast and varied resources of our prosperous nation have been measured by its use and are now a matter of record. It is a fact beyond controversy, that a radical change in it would be a calamity to which nothing short of war could be compared. The direct cost of such a change is almost incredible, and the indirect cost of course can scarcely be imagined. On the authority of Coleman Sellers, M. E., or at least taking his estimate for his own shop as a basis, it would cost \$30,000,000 (thirty millions of dollars) to change the machinery in the machine shops of this country to conform to the metric system, and that would be only a beginning of the trouble. Shall we, then, at this late day, in the face of these facts change all for the sake of a system which in this case would bring, instead of order, more confusion than the system could compensate for in a thousand years? Or shall we, as far as practicable, systematize our own metrology?

Much time has been consumed by this Society in discussing proposed plans for systematizing our weights and measures; some of which change everything, even the radix of our numeration, and others change nothing except in name, and leave us just where we began, without any system.

Let us examine two of these proposed plans, representing as they do the two extremes, Alfred B. Taylor's and Mr. Davies'. Mr. Taylor has given this subject more attention than any other man in this country perhaps, and you all no doubt are familiar with his report on it, which was published by this Society dur-

ing the year 1882. In his report he proposes two systems, one decimal and one with a radix of eight, giving the preference to the latter for reasons which to many may seem good.

His decimal system has the faults common to nearly all I have seen advocated, viz: Firstly—The applications of old names to new quantities. Secondly—The unnecessary length of tables. Thirdly—The lack of any attempt at system; everything having been sacrificed for old names and decimalization.

Evidently the application of old names to new quantities would only increase the confusion which already exists from the same cause. We already have three kinds of pound, five or more ounces, and an unlimited number of pints, quarts, gallons, bushels, and what not. To still add others would be adding “insult to injury.”

Experience teaches us that as a rule few denominations are needed. In a decimal system the number need only be three in most cases. For example we have our money which, though divided into mills, cents, dimes, dollars, and eagles, in the tables is practically reduced to dollars and cents. Taking the metric system for example, we find that, although it has its table of weights arranged decimals, with each denomination ascending and descending provided with a formidable name denoting its value, only three of these denominations ever come into practical use: the gramme, the unit, the milligramme, descending, and the kilogramme, ascending. It will thus be seen that a very few denominations will fulfill every requirement, and that the chances are the tables will be shortened by those using them if the tablemaker neglects to do it. In my opinion, nothing will militate so effectually with the masses against any new system as a long list of high sounding or meaningless names.

But Mr. Taylor does not advocate a decimal system, and says: “A decimal system applied to weights and measures *must* result in failure;” and again he says: “All experience has shown that the primary and most needful divisions of all the more common units of measure is into halves and quarters.” Even admitting the correctness of this statement, I contend that we experience no difficulty in dividing our money into

halves and quarters, and the inch can be similarly treated when used decimally. But I am inclined to deny the propriety of these objections to the decimal division, and to stigmatize the inclination to divide into halves and quarters as a relic of ignorance, and the argument that a string may be divided into halves and quarters without the aid of measures, but cannot be so divided into tenths, as a relic of barbarism. We have mechanism by which we can divide our standard units into any fraction desired, and into tenths as readily as any other. Our system should be cosmopolitan in its nature and not designed for the exclusive use of any special class. We should not, however, forego the advantages of a decimal system, because a large class of people cannot understand decimals; firstly, because it is to be feared that those who cannot comprehend decimals cannot comprehend numbers at all; and secondly, because this is preeminently a country in which the masses are or are to be educated.

It is quite evident that whatever merit an octonary system may have when considered in the abstract, it must fail in application either from the incompatibility of its radix with that of our denary numerals, or from the impossibility or impracticability of changing our present radix, which Mr. Taylor suggests as desirable. I am of the opinion that such a change would be far more objectionable than the adoption of the metric system would be.

Let us now look at the changes proposed by Mr. Davies who stands at the other extreme of reformation, and who though proposing many very excellent things leaves them very much as he finds them, without any system. Mr. Davies proposes to retain the inch as a unit, to allow the foot to be a unit, to retain the yard as still another unit with the privilege of using them decimally. Now this does one of two things; either it changes nothing at all or it makes three distinct forms of linear measurement where only one is needed. It is not necessary to comment further upon Mr. Davies' plan except as to the table of weights where he still retains the ton of 2000 pounds which, besides not being a decimal quantity, has the objection of being the name of two different quantities.

Nearly two years ago, in conformity with a resolution adopted

by this Society, a committee was appointed to draft a table of weights and measures based upon the units now in use. The committee (at least the chairman of it) understood by this that they were to use such units as were most essential in our present metrology making only such changes as should simplify and systematize, and eradicate the incongruities which have already been mentioned.

Much correspondence was indulged in by the members of the committee, but nothing definite could be arrived at from this source. Mr. J. R. Skinner of Cincinnati, O., was of the opinion that our present civilization was so interwoven with our linear metrology that to interfere with the latter either in quantity or denomination would have the effect of distorting the former. As to the other branches of metrology he could not speak advisedly. Mr. Taylor reported in full, and you have already been made acquainted with his views. Dr. J. E. Smith did not want to fence himself in or out from a good thing. He was therefore noncommittal. Mr. Charles Latimer has promised to, but never has, committed himself upon this subject. And Prof. W. A. Rogers was noncommittal to the extent of not understanding the plans of the Society and could therefore express no opinion.

It therefore devolves upon the chairman, who has decided views upon this important subject, to report as far as possible at present, his own views, and term it the report of the committee. Briefly stated his opinion is that we *must have a decimal system* based upon our British inch and pound avoirdupois, or we will be compelled to adopt the metric system.

As previously stated, if we were without weights and measures our task would be comparatively easy. But when we consider how closely interwoven our national history is with our national metrology, when we consider how loath people are to depart from old customs and methods no matter how much more convenient new ones may be, we almost shrink from the task of suggesting any changes. However, when we consider that our metrology is not systematic, being neither binary, octonary, denary nor duodenary, and that by very simple changes, not affecting or confusing our historical records, we may in a great

measure overcome these defects, we feel encouraged to make the following suggestions.

No doubt a duodecimal system could be made more often to coincide with our present tables than any other, but it is quite evident that although a duodecimal system would have many advantages, and, although we must of necessity use that part relating to angles and time duodecimally, it is unquestionably a fact that all other portions of the system must be arranged decimallly in order to arrive at the greatest degree of usefulness.

A careful study of our weights and measures will develop the fact that they are much more complicated than is necessary, both as to number of tables and number of denominations in them.

It is quite evident that a weight which is suitable for fixing the value of a quantity of iron is equally suitable for determining the value of a bar of gold or a package of quinine, therefore no necessity exist for having any other than one table of weights for all purposes. The pound avoirdupois would unquestionably make the best unit under the circumstances.

Again it is evident that the inch which is the universal unit of British and American linear measures is capable of representing the quantity of anything which covers or fills space—long measure which extends in one direction only—square measure which extends in two directions, representing length and breadth—cubic or capacity measure which includes everything having length, breadth and thickness.

By following out these suggestions we find our metrology narrowed and simplified into the following

TABLE OF UNITS, VIZ.:

Angle,	Unit,	Degree,	}	Duodecimal.
Time,	Unit,	Hour,		
Space,	Unit,	Inch,	}	Decimal.
Space, Square, Unit,	Inch,			
Space, Cubic, Unit,	Inch.			
Weight, Unit,	Pound—	Decimal.		
Money, Unit,	Dollar—	Decimal.		

This table of units, expanded as far as necessary to meet all reasonable demands, would give rise to the following

TABLE OF USEFUL DENOMINATIONS.

ANGLES.

Circle.	Degree,	Minute,	Second.
	I =	60 ;	3,600 60

TIME.

Day.	Hour.	Minute.	Second.
	I =	60 ;	3,600 60

LONG MEASURE.

Decapode.	Pode.	Inch.
		I
I	=	10
I	=	100

SQUARE MEASURE.

Decapode Sq.	Pode Sq.	Inch Sq.
		I
I	=	100
I	=	1,000

CUBIC MEASURE.

Decapode Cube.	Pode Cube.	Inch Cube.
		I
I	=	1,000
I	=	1,000,000

WEIGHT.

Ten.	Cental.	Can.	Pound.	Millipound.
			I =	1,000
			I =	10,000
			I =	100,000
I	=	10	=	1,000,000
I	=	100	=	1,000,000

MONEY.

Dollar.	Cent.	
	I	
I	=	100

No attempt has been made to establish any coincidence between weight and measure. It is evident from their names that they are wholly independent of each other; being only convertible terms when applied to known substances under known conditions. This being the case it follows that the pound is as proper for a unit as would be a cubic inch of distilled water at its greatest density, and infinitely better since we have the pound already in use.

No mention has been made in this scheme of land measure.

Firstly, because a measure suitable for a board or a piece of cloth is also suitable for the earth's surface. And secondly, because our present land measure is a matter of record to such an extent that it would be impossible to make a change even if desirable. These remarks apply equally well to the mile.

The absence of a table of measure of capacity will be noticed by those who are accustomed to think it indispensable. But it will be conceded by them that a cubic pode or 1000 cubic inches would be as just a quantity as any of the numerous bushels containing 2145.42 inches, or 2218.192 or 2815.2198, or $2150\frac{2}{3}$, or 2150.4, and it is probable they will concede that they have a better conception of the quantity contained in the cube pode by hearing it told once than a whole lifetime of constant use could give them of the bushel. The same remarks hold good when applied to the gallon, of which we have a variety of sizes. Of all the absurd arrangements possible our tables of measures of capacity are certainly the most unreasonable, and as they are perfectly superfluous no difficulty will be experienced in suppressing them.

This ends the report proper but I wish to add a few somewhat irrelevant and disconnected notes.

Firstly:—I believe our weights and measures should be guaranteed us by the national constitution and not be subject to either State or national legislation.

Secondly:—Considering the general tendency toward decimal systems it is to be regretted that the twenty cent coin was suppressed instead of stopping the coinage of quarter dollars.

Thirdly:—The present move toward standard time, though probably in the right direction, is unfortunately far short of that sweeping character necessary to make finished work. There is room for grave doubts of its perfect success as it leaves the country in matters of time much the same as it is in measures of capacity, very much confused. If the 90th meridian had been adopted as standard for the whole continent we should then have had standard time in its true sense. Now there is no such thing and the present move will be more damage than benefit to the cause.

N. B. WOOD.

ANALOGY.

Students of the International Institute will agree with me, I think, when I say that the only solution of the teachings (which we claim are in the Great Pyramid) is through analogy. No one undertakes to advance an idea in this line of thought except through the talent of comparativeness. And when accepted in this light the deepest mind may feast npon it and delve into the past, present, and future mysteries of the world's history.

That comparativeness or analogy is the ruling principle that must first be understood in the study of scripture is also apparent to the deepest students of God's word that the world has ever known. Bishop Butlers' Analogy is a text book used by the best institutions of learning in the world, yet it but barely touches the borders of the seemingly impenetrable mysteries of scripture which are now being revealed, and which have been locked up in the Great Pyramid for generations. From the beginning of the old world as recorded in the word of God, we can discover through analogy the plan of the new creation. When God said "let there be light" that light symbolized Him who was to be the "light of the world." When He created the sun it was but a type of the "sun of righteousness." The first Adam of the flesh was a type of the Second Adam of the Spirit. The first sacrifice of "Righteous Abel" was a type of the true sacrifice, Jesus Christ.

The discovery of the nakedness of our first parents was a type of the ultimate discovery of the nakedness of *every* sinner. For said the Lord, "Blessed is he who keepeth his garments lest he walk naked and they are his shame." And thus we might go on showing that what seems foolishness to the world, to the profound and sanctified student of God's word is the deepest storehouse of treasures to which analogy is the key. Analogy is also the most impressive manner of teaching scriptural truth. The minister or Sunday-school teacher who, by comparison, explains the teachings of the word leaves the most

lasting impressions upon his hearers. The Psalmist acknowledges the force of this order of teaching when he says, "I will incline mine ear to a parable;" while Solomon, the wise, compares the man who is unable to comprehend analogy to the lame man whose legs are of unequal length; for he says, "So is a parable in the mouth of fools." In other words, he who cannot comprehend this great key of truth is unbalanced. And so great and perfect was this quality found in the perfect man Jesus Christ, that "without a parable spake he not unto them." It would have been a very easy matter for our Lord to have revealed to the apostles what the kingdom of heaven was like; but his teachings were of the highest order and had a tendency to develop rather than dwarf all the faculties; hence he said the kingdom of heaven was like a grain of mustard seed, like leaven, like a king, like a householder, and many more. Could not God have told Peter that "salvation had come to the Gentiles" in some other way than by letting down a great sheet filled with unclean beasts and creeping things? He certainly could, but he would not have thus developed that gift of mind which all the prophets and apostles needed, and which we need as much at this present time to solve the mysterious teachings of God, whether they be in scripture or the Great Pyramid.

Let us, therefore, through this God-given power try and discover the meaning of one of the singular ceremonies under the Mosaic law. God's instruction to the children of Israel was, "With all thine offerings thou shalt offer salt." While the words of the Saviour are: "Every sacrifice shall be salt." Now Christ was the true sacrifice. To his apostles he said: "Ye are the salt of the earth." If, therefore, *every* sacrifice was salted, the true sacrifice would needs be salted, otherwise it would not be a true antetype; hence it was necessary that the apostles (who were the salt) should become a part of the true sacrifice by themselves being persecuted and put to death, otherwise they would not be the true antetype of the salt of the sacrifice. Salt is a preservative. All the apostles, prophets and saints, the true followers of Christ, are therefore salt of the earth; because they preserve and hand down the teachings and laws of God. Now whatever preserves these

laws and teachings of our Lord is analogous to salt. Salt crystallizes into two forms, the one a perfect cube, the other a perfect pyramid. In the second chapter of Ephesians we read of the building of God in which the saints are "built upon the foundation of the apostles and prophets, Jesus Christ being the chief or head or top corner stone," and which we interpret as a spiritual pyramid. While in Revelation we have the Holy City described as a perfect cube in which the twelve foundations are undoubtedly these twelve apostles again. How significant then that the salt of the earth is to be built into habitations for God, and that both buildings are of the same form in which the natural salt crystallizes, and that both the natural and spiritual salt are a part of the sacrifice. And furthermore how significant that the Great Pyramid has one of these forms, that it is called "an altar in the midst of the land of Egypt," and that the word altar means a place of sacrifice. As salt is a preservative, so the Pyramid preserves the teachings of our Lord.

Salt crystallizes in the form of a pyramid only in the presence of heat, and so perfect are these crystals a type of the Great Pyramid that they are made up of regular courses one upon the other.

Up to the time of the completion of the spiritual pyramid, when the Lord, the *capstone*, is to appear, the sun is to give his light; but when that time comes the sun is to be turned to darkness, and we come to the time for the Holy City—the New Jerusalem. Of this, John says it "had no need of the sun." While of those who serve God in the temple, he says, "Neither shall the sun light on them, nor any heat." Now it is just under these conditions we get the two forms of crystals; *with* heat, as already stated, we get the pyramids; *without* heat, we get the cubes. If the Pyramid is a type of the spiritual temple made up of prophets and apostles, then the stones must represent them. If the stones of the Pyramid are not symbols of the prophets and apostles, why do we find large courses above small ones? why not put all the large stones near the bottom where they would be easy to handle? why build up several small courses, and then haul a large one up two hundred

feet or more? Supposing that, according to the signs of the times, we are nearing the completion of this spiritual building, and that Christ's coming is not many years off, according to his own teachings, which he tells us to judge by as we judge the approach of summer, by the budding of the trees, we will then have in the neighborhood of about six thousand years for the building of this spiritual pyramid, which time corresponds to the six working days of the week, a day being as a thousand years, as Peter puts it, and the seventh day, or thousand years of Christ's reign, mentioned by John, and called the Sabbath of rest by Paul, as shortly to come. Going back to the third thousand years, or about one thousand years before Christ, we find David and Solomon conspicuous in the world. So near the middle of the Pyramid we find two large courses, the lower one representing David, the upper one Solomon. Solomon was the builder of the temple and the greatest king the world has any record of, hence the connection between this course and the King's Chamber. After this manner, any one can see that all the conspicuous courses of the Pyramid correspond with the conspicuous characters of the world, who figure in the holy word of God.

The passage known as the Grand Gallery symbolizes the progress of Christianity in its purity—ever looking upward, ever on the ascendency, and from this on we find volumes of information that insures us that this is the passage and chamber of our Lord and King. The Queen's Chamber and the passage leading to it have been assigned to the Jewish Church, yet, to my mind, not a particle of evidence is to be found to substantiate this view, while on the other hand I find satisfactory evidence to show that the Queen's Chamber and its passage symbolizes the Church of Rome. This church worships and adores the saints and apostles who were the salt of the earth, which is typified by the walls of the Queen's Chamber being covered with salt. The passage leading to the chamber shows a sameness up to 1491. If this symbolizes the Jewish record, why the downward step at that date? What did the Jews at that time of prominent dishonorable note, which this downward step symbolizes? Ask, however, the Church of Rome who that

year began the general persecution of the Christians. The upper chamber is called the King's Chamber, because he is "King of Kings and Lord of Lords." The lower one is called the Queen's Chamber, because she says, in her heart: "I sit as a Queen, and am no widow, and shall see no sorrow. Therefore shall her plagues come upon her in one day—death and mourning and famine, and she shall be utterly burned with fire, for strong is the Lord that judgeth her." In this Queen's Chamber is a niche with ten offsets; what has this to do with the progress of the year at the dates it represents? To Rome, however, it is the beast with ten horns, which measurements represent the time of the rise and fall of the ten kings which "have one mind and give their power to the beast." The coffer in the King's Chamber, unlike the niche, discloses dimensions corresponding with those of the tabernacle. As conclusive evidence that Rome is meant by the beast here mentioned, we have the fact that the word Roman, as written in the three languages inscribed over the head of our Saviour, have each a numerical value of 666, which is given as the number of the beast in Rev. xiii.: 18. We have furthermore the inscription over the entrance of the Vatican, "*Vicarius filii Dei*"—"Vicar of the Son of God;" a title which popes have assumed, and the numerical value of which is just 666. In solving a mathematical problem, if one figure is wrong, we may work a lifetime without obtaining a correct solution; and in undertaking to solve this Great Pyramidal problem, we must have each passage and chamber assigned to its proper place before we can expect progress. But some will say, we have good Roman Catholics in the Society, whose work we value highly. Thanks be to God for this—it will test their sincerity and love of truth, and if, in wielding this sword of the spirit, they must sacrifice creed for truth, well and good, for he that will make such a sacrifice is worthy; but he that will sacrifice truth for creed is not worthy. Let us battle for truth then, and when discovered, announce it, though the heavens fall, and though in the announcement we must sacrifice the dearest ties of earth. For, says the blessed Master, "He that will not leave all and follow me, is not worthy of me."

W. T. ALAN.

“LET EVERY SAXON SING.”

“I knew a very wise man who believed that if a man were permitted to make all the ballads, he need not care who should make the laws of a Nation.”—[ANDREW FLETCHER.]

Following the fortunes of the Scouts, or Khumry, “the wandering race,” ever since their first appearance upon the stage of history, the national minstrel has been an ever present and prominent figure. Along the whole course of their existence we find its grandest epochs marked by lofty and soul stirring anthems, by hymns of praise and victory, or else by psalms of sorrow and repentance unequaled by any in the musical conservatories of all other peoples put together. Their music has always been national—known and familiar to the people. They have sung it as they labored, sung it in battle, and sung it in peace about their hearth-stones. As Israel sang, so sang the ancient Saxon.

But the bards of Palestine and those of Britain had more in kin than in the mere sympathy and bond of music; they had that of *blood*, the slightest trace of which flowing in the veins of any people sets all the rest a-tingle at a truly martial or religious air.

The Romans sang not, nor the Greeks as nations, but the Norseman sang in war and peace, on land and sea, and bore his lays across the channel to the “Islands of the West.” The music of Gideon’s Manassite Band was repeated in the days of Cromwell and the Puritans; and its rhythm still stirs the souls of those who are descended from the Pilgrim Fathers.

There is nothing in common between the soft love songs of the south and those grand airs that led the northern people on to victory, thanksgiving and to prayer. The former are lays of indolence, and foster what they varnish—*vice*. The latter are the soul outpourings of a fervent people, schooled amid the rigors of the wilderness back into the ways of Him who led them there to plead with them in the north country—they are songs which cherish *virtue* and leave it twined about the

heart-strings tuned thereto. It is the God of Israel that has done this for "His people," and it is a glorious privilege for them to raise their voices in harmony with their hammers as they hew out their name 'neath His name on the everlasting rock of destiny.

In the great moral "Battle of the Standards," into which we Anglo-Saxons, as a race, are soon about to enter, and for which we are even now equipping us, music must also play a prominent part. We must not underrate its value. As an ally its enkindling voice must be heard among us. As a stimulant to ardor and endeavor, music will hardly lend encouragement to those who fight beneath the "Metric" standard. We may doubt if any real enthusiasm can be raised in Anglo-Saxon hearts by songs turned out of measure to our "old traditions." We may deem him a traitor to his race, as misguided and short-sighted, to say the least, who raises his voice and forces his heart to warm in unison to metric terms his fathers knew not, and whose specious names and values can only teach his children to deal doubtfully with those about them.

In the signs of the times, nothing is so clear as that an international age is dawning on the earth, and it behooves each Anglo-Saxon to acquaint himself thoroughly with what the purport of each universal project really means. *'Shall the Anglo-Saxon go abroad for his measures and his weights?* May God forbid.

Can it be possible that a people destined beyond all controversy to rule the earth, whose language is daily becoming more universal, whose "Open Bibles" are in every nation's hands, whose commerce already dots the sea with sails, whose laws are models for all other men, whose literature and science, art and culture, like vines of hardy growth put out their shoots so vigorously that all others die before them—can it be possible that those who preeminently in the world's history have had the favored mission to teach justice and fair dealing unto all mankind, shall awaken to the humiliation that the *measures* with which they have meted, and the *weights* by which their heaping gifts were given without stint, are false, untrue,

and not as worthy of perpetuation as their stock, their language, their religion and their laws?

No, God doth forbid it, for it is not true. The measures of the Anglo-Saxon race are without compeers in metrology, and a mighty responsibility devolves upon us into whose keeping they have now come down, to see that they, too, are carefully preserved in this final struggle of the nations for supremacy.

No one whose eyes are open doubts but that these things are so, nor doubts but that by measure and by weight we trace ourselves to golden ages of the earlier days, and that these things were given from above. And we who know these things must open all men's eyes until the standard raised above our ranks is as cherished from a consciousness of its *intrinsic* beauty as it is among us now, from use, long custom and from earliest teachings.

Unfurl the standard, then, and give it to the breeze. Bear it the length and breadth of every Saxon land, and plant it on the gates of all our enemies. And let singers go before it to awaken all who sleep, and stir them till all English people sing in voice like as of olden times. We have entered in upon our inheritance, but "the Canaanite is still in the land;" before us Jericho looms up, whose walls must fall before we can destroy its idols and melt down its vessels of brass, of silver and of gold to things commensuric with heaven and earth. Within its walls are mighty men of valor, but the standard they have raised has been a drooping one since Nimrod's days. Upon the soil of Isaac's sons it cannot flourish, and is doomed to bite the dust.

Down with it, then, and let music go before us to the Siege. Compass the city and let the *people set up a shout*, and no demagogue will dare thenceforward to propose within our legislative halls a "mark" for the nation's hands by which our fathers bought not, and by which our children shall not sell.

We are entering upon our inheritance in the name of the Lord of Hosts and of the people of the conquering race, and the captain of the host with drawn sword stands over against us and shall smite our adversaries for us. The question of metrology cannot be settled at the nation's capital; it is too

national, too closely knitted to our daily life to be in jeopardy at any nation's capital. Upon such topics every freeman has a right to cast his single and independent vote, and will not, cannot delegate the privilege of proxy to another, be he a representative how tried so ever. To change our times and seasons and weights and measures is beyond the power of Congress. To deal with this matter above all others upon earth, the people have reserved their right. Let then the people rise and make their very constitution clear upon this point. Since in times past their representatives have dared to tread and trespass upon domain never ceded *let us fence it in with Anglo-Saxon units* and write above its gates :

"A pint's a pound the world around
For rich and poor the same,
Just measure and a perfect weight
Called by their ancient name."

C. A. L. TOTTEN.

THE UNVEILING OF ISIS.

II.

The subject of weights and measures leads us to the investigation into the origin of races, language, science and religion. It is with the knowledge of the breadth and depth of the subject that I take a retrospective view of the peopling of our country and the remarkable providential circumstances which led to the rise of our nation or gathering of the people to these shores; and this paper is the proper introduction to the astronomical or astrological, to the archæological as well as the mythological, all of which will be found relevant to our study.

I must go back thirty years in my life in order to begin the story which has led me to undertake that which is implied in the title of these papers. I was stationed in the city of Jackson, Tennessee, a beautiful inland town of cultured inhabitants, helping to build the first railroad that passed through that place. It was a peaceful age and it seemed as if the questions which

had agitated nations were now to be settled by arbitration, and that war could no more come to disturb this fair land—almost as fair as Eden. And yet but few years passed when the whole country was whitened with tents of military camps; two millions of men were battling with each other for and against a great principle. Cotton was king. Slavery was the support of the king. Four years passed and the war was over, and I was again in that land, now desolated by the ravages of that war. But its population could now say: "Now has come salvation; for our nation had been accused by England and the European nations of flaunting a lie in the face of the world, inasmuch as it had slavery on its escutcheon and yet was calling itself a republic and proclaiming the equal rights of man."

It was in 1855, in this town, that I first heard S. D. Baldwin, President of the Soule Female College of Tennessee, speak upon the existence of the United States as foretold in the Bible—their future greatness, their invasion by the allied powers, their expansion, their dominion over the whole world. The words of this remarkable man awakened a new thought, a new inspiration, a new aspiration in me, and from that time I began to study earnestly to see whether it could be possible that this great continent, this great republic of ours could have been foretold by the prophets; and from that time until the present time my mind has been fully awake, and constantly in the hope of wider investigation and further understanding.

The scope of this great man's thought was as follows: that the United States of America was the government which had been foretold by the prophets as the one before all other nations of the earth; in other words, God's government—a theocratic government, the restoration of the government represented by the "Ancient of Days," which was to come as "the stone cut out of the mountain" to destroy and break in pieces all of the effete and waning governments of the earth, and to cement it into one grand theocratic republic acknowledging God as its king. In other words, that it was the true Israel restored; that Palestine was but a type of the Palestine of the western or new world; that Jerusalem was but the type of another great city represented by brotherly love which should come down

from heaven as a bride adorned for her husband, unto which all of the nations of the earth should flow, and whose light should be shed brightly for all other nations of the earth until they should become kingdoms of the Lord Jesus Christ. Such was the magnificent thought of Baldwin.

I cannot forbear, in writing this of him, to recall the wonderful power of his prayer—the pathos of his voice and the extraordinary and deep earnestness of his teachings, such as to convince the hearer that there was some great truth in his thoughts. One of the most important of all his thoughts was this—that the woman with the twelve stars and the man child were the Christian Church and the United States of America; that these twelve stars represented the twelve colonies of America. How, he did not explain, but declared that this must be the interpretation of the vision. Up to this time the words of the prophets of the Old and New Testament had been as a sealed book to me. I had never studied their application. I had never been able to understand them, but, reading carefully his book, and the scriptures, and comparing them with Elliot, Barnes, Newton, Cummings and other commentators, I felt that there was great truth in Mr. Baldwin's presentation of the subject. His conclusion that a great battle, called the battle of Armageddon, would take place in our own country in the latter day, in which all the powers of evil would be engaged against us, struck me with great force also. And I am sure that the expression of the feelings of every thoughtful man shows that ever since the war for the salvation of the republic and for the destruction of slavery, there has been an unrest in the people and a looking forward to a grander and more important crisis in the world's history than even that gigantic struggle in our own land that sounded the death-knell of slavery; and while I write now, I can not but believe that we are close upon that great battle which shall try to the uttermost the powers of this great republic. We are upon the very threshold of it, and it behooves every citizen, not only of the republic, but of the world, who values the civilization of the race, to hold fast to the teachings of the scriptures which testify of these dreadful days, to work for that grand era which is now close before us, and

to be strengthened thereby with faith, that we may be turned neither to the right nor to the left, but move straight on in the path of honor and glory, working in and for the kingdom which Jesus Christ has set up upon the earth to bless all nations and all races of men. Writing as a citizen of the republic, I write also as a citizen of the republic of the world, where "there is no Jew nor Greek, neither bond nor free, Barbarian or Scythian," but all are one who believe and work under the banner of His kingdom. Mr. Baldwin's thought has been with me now twenty-nine years, and Revelation xiii.: 1 has been the subject of ever recurring interest. How could he make the twelve stars of this verse a woman clothed with the sun and a crown with twelve stars upon her head and the moon under her feet refer to our country? How could he make these twelve stars the colonies of America? The symbols of the prophets, taken alone, have always seemed insufficient. A mere symbolism of the prophecy, without strong astronomical proof, now seems to me as unprofitable; both together would bring overwhelming demonstration. Connected with this thought there came before my mind three men, as associated with this verse, namely, Columbus, Luther and Washington, and in considering the subject of the prophecy concerning our country, I could never disassociate it from these three great characters.

Some ten years ago, in contemplating this subject, the thought came to my mind that if I should paint the first verse of the twelfth chapter of Revelation, I would paint the flag of the United States; for a woman clothed with the sun would naturally have the clothing of the sunlight—white and red, and the stars must naturally be placed in blue. The moon placed at the feet would be an adjunct, and as the faithful witness in the scriptures.

This thought added strongly to the idea of Mr. Baldwin, who had said that these stars represented the colonies of America—an idea which seemed to me not conclusively proven, yet extremely plausible. Elliot, in his commentary, after having reached the Reformation, when he is brought to this twelfth chapter of Revelation, goes back to the fourth century, to the rise of the Roman Christian Empire under Constantine

and the union of Church and State, A. D., 325. All commentators have taken up the church as represented by the woman, the sun representing civil power. Some others have represented the moon as the Jewish Church—others as France, but, taken as a whole, I had it painted as represented by St. John, and we have a heavenly representation of our flag, given by Rodman Drake in the grand poem, as if he had had an inspiration of the same thought :

When Freedom from her mountain height
Unfurl'd her standard to the air,
She tore the azure robe of night,
And set the stars of glory there.
She mingled with its gorgeous dyes
The milky baldric of the skies,
And striped its pure, celestial white,
With streakings of the morning light;
Then from his mansion in the sun
She call'd her eagle bearer down,
And gave unto his mighty hand
The symbol of her chosen land.

* * * *

Flag of the free hearts' hope and home !
By angel hands to valor given ;
Thy stars have lit the welkin dome,
And all thy hues were born in heaven.
Forever float thy standard sheet !
Where breathes the foe but falls before us
With Freedom's soil beneath our feet,
And Freedom's banner streaming o'er us ?

In my presentation of this subject I do not design nor desire to become rhetorical. I have greater reliance upon the beauty and convincing nature of the subject itself to win the reader's attention than upon any style I shall or could adopt. The thought had been with me many years before I decided to give it publicity, and it was while I was confined with a severe illness at Meadville, Pa., in the summer of 1875, that I was more strongly moved to its investigation and study. At this time I happened to see a notice in the New York *Herald* asking the masons of the country, since they were versed in symbolism, if they could not give the symbol of the American flag. Notwithstanding the nature and pressing demands of my vocation upon time and attention, I felt a strong desire to do this. Upon the day of my recovery, and when I was about to take

the train for the first time after my illness, I was approached by a gentleman who said he had been appointed as a committee of one to request me to deliver an address on the subject. I told him I was not in the habit of speaking and he had better seek another, but, upon his insisting, I finally agreed to comply, with the understanding that I was to have ample time for preparation, and accordingly in the spring of 1876 I delivered before the Library Association in Meadville, my first address on the American flag.

At this time, although I believed that there was a mine to explore, I had detected nothing further than historical and symbolic prophetic coincidences, and I agreed with and endorsed Mr. Baldwin only so far as he asserted that the woman symbolized the Christian Church, and the sun, civil power. But the moon I considered to be the emblem of Moslem power. My thought was that the woman clothed with the sun, with twelve stars upon her head and the moon beneath her feet, represented the government of Christendom clothing the Christian Church, and the moon, the symbol of Moslem rule, beneath the feet of that Christian Church, while the twelve stars that made a crown about her head shadowed forth the new government which was to arise. As I have previously stated, in the grand unfolding of this, God's plan wrought in symbol, there have ever been associated in my mind the trinity of three grand characters, whose names cannot die while history lives, COLUMBUS, LUTHER, WASHINGTON.

Inseparably connected with the name and fame of the great Columbus, associated in history and partner in the meed of praise, is and ought to be the name of Isabella, the Christian queen. The story of the aid given by this grand woman to the bold navigator is too familiar to need repetition here, but it is meet that we should at least glance at Europe in her dark plight before the three small ships, which bore the hope of the ages, the generous giver of a new world, quit the port of Palos.

This was the midnight of history. Not since created man "had begun his march through the ages" had his abiding place, the old world, been immersed in such darkness. Well has this long dreary waste of time been styled by succeeding genera-

tions "The Dark Ages," and aptly have these years of wrong been likened to the deluge of God when "the windows of heaven" were opened and the waters poured forth and covered the earth. Hate of man against his fellow-man, persecution, tyranny, oppression and wrong, these make up the story of this, the day of Torquemada, the Holy Inquisition, the fagot and the torch. It was fitting that the Divine Ruler of events should send forth from shores of lands so oppressed one of his greatest servants to find, far out in the pathless ocean, far out beyond *ultima Thule*, the edge and confines of the ancient world, a new continent, the other half of the habitable globe, and bring back through peril and hardship the great tidings that the oppressed might flee his oppressor, that erring man might try in the new to correct the folly, the cruelty and crime of the old world.

As the dove flew from the window of the ark to return with the twig of the vernal earth, so went forth Columbus, no less a divine messenger, to return with little more than a twig of the new land, but with such news as Europe had listened long to hear. Christophero Columba—the Christ-bearer dove (Christus, Christ; phero, bearer, and Columbus from columba, dove) sailed away from Europe, sailed he knew not whither, sailed under the guidance of God, sailed to the continent of which Seneca, in his Medea, said:

"After the lapse of years, ages will come in which Ocean will relax his chains round the world and a vast continent shall appear, and Tiphys, the pilot, shall explore new regions, and Thule shall no longer be the utmost verge of the earth."

For thousands of years this jewel had lain between the great seas. It had been hidden—unknown. The heart of man was too full of strife and contention—cruelty, hatred and uncharitableness—too full of bigotry and superstition for his eye to look beyond the confines of his narrow limits that he might see this great pearl, one entire and perfect chrysolite—a great continent, stretching from north to south, from east to west, awaiting its recognition—

THE LOST ATLANTIS.

"Upon it the Creator had lavished his choicest gifts, and dur-

ing long ages had continued to treasure up the most bountiful stores of the magazine of nature. It was a place of beauty; it was a land of broad rivers, of mighty cataracts, of lofty mountains, of wide, fertile plains, of wondrous forests, of exhaustless mines of gold and silver, of copper, of iron, of coal. Here were found all choicest flowers and fruits, the noblest trees; here stalked the mighty behemoth, the stately elk, the timid deer; here ranged herds of buffaloes and horses, with cattle upon a thousand hills; here sang the sweet birds, their notes reverberating in the silent forest and rising in praise to their Maker; here also were found as pilots to unexplored regions, the poor savages worshiping that Great Spirit whose designs, with blinded eyes, they did ignorantly forward."

Who shall paint that picture, that great spectacle, the landing of Columbus? We may use both pen and brush, but we cannot give it full expression; to feel his gratitude we must first have felt his longing; to see the relief of his rebellious crew we must have felt their fear, their terror, as all land, all that was known to them and their fellow men, faded from their terrified sight, and day and night, the sun and the moon rose and fell, and still they saw not the land, until at last that mute guide, in which the men had already learned to put unquestioning trust, wavered, oscillated with aimless, unmeaning pointing over the trackless ocean. Other men have conquered man's hate,—Columbus alone conquered his fears and doubts.

And then what shall we say of his return? Before Ferdinand and Isabella, seated in royal state, he poured forth the tale of his hardships and triumphs. Like Othello to the Venetian senator, he delivered himself of that recital which should and shall live in book of man's great acts to the last page of recorded time. Of mountain, river, plain and forest he spoke; of the wealth, the beauty and the utility of the new world, and in the inspiration of his soul cried out:

"I am the messenger of the new heavens and the new earth, mentioned by the Prophet Isaiah and in the Apocalypse of St. John, and the Lord told me where to find it."

In the island of Santa Domingo, the resting place of this great man was found. The inscription upon his tomb reads thus:

"This spot conceals the body of the renowned Columbus, whose name towers to the stars. Not satisfied with the known globe, he added to all the old an unknown world. Throughout all countries he distributed untold wealth, and gave to heaven unnumbered souls. He found an extended field for gospel missions, and conferred prosperity upon the reign of our monarch."

Marvelous is the legend of St. Christopher, first called Offero, the bearer, because of his great strength and prowess. Compelled by poverty to serve some one, he resolved to serve only the most powerful, and therefore sought the king. But observing that even the monarch, at the mention of the name Satan, crossed himself in fear and trembling, and learning from him that he did so to escape the power of the devil, he quit that service to seek that of the devil, for forsooth, by the king's confession, he was the more powerful. But Offero had not yet found the service of the all-powerful one, for he observed that Satan and his hosts, in their march, turned aside to avoid a cross, "whose influence even they feared," and therefore Offero went to find the Lord, that he might serve him. But although he sought with eagerness, he found him not, but was directed by a hermit to do the Lord's service by carrying across a swift, broad stream those who came to its edge. Thus, as a giant ferryman, lived Offero, in a hut at the river bank, when one day he heard the voice of a child without his door, pleading to be taken over. The giant took up his slight burden and started for the other shore, but as he got out into the stream his load increased in weight until it was with difficulty that the giant bore up under it. But he performed his task undertaken and reached the farther bank, declaring as he did so that he must have borne the whole world. He was answered, not in the tones of a child, but in the voice of a God, that he had done more, for he had that day borne Him who made the world. Thus, says the legend, was given him the prophetic name of Christopher.

The deserving sharer of the praise, which a graceful posterity will ever have for Columbus, is Queen Isabella. Beautiful, accomplished, pious, great, the historian says of her :

"It seems as if Heaven had raised her up for two purposes, the overthrow of the Crescent and the discovery of the New World."

Cardinal Ximenes says: "In the worlds of our planetary system, the sun never clothed or illumined her equal."

The words have an untold and unsuspected depth of meaning. "A woman appeared in Heaven—a woman clothed with the sun and with a crown of twelve stars upon her head and the moon under her feet."

Wonderful is the power of woman for right, for truth, for good.

"Honor'd be woman! she beams on the sight,
Graceful and fair, like a being of light,
Scatters around her wherever she strays,
Roses of bliss o'er our thorn-covered ways;
Roses of Paradise sent from above,
To be gathered and twined in a garland of love."

Queen Isabella, through whose power and munificence Columbus was enabled to find a world, was a fitting type of noble womanhood for the great work entrusted to her by the Almighty.

The great queen was essentially the woman of chivalry—the culminating feminine personation of a system, which, in spite of its defects, preserved all that was great and glorious in humanity through an age darkened by superstition, enveloped in bigotry and stained with the blood of martyrs and prophets.

Isabella was a woman of rare beauty—especially in Spain—with blue eyes and golden hair, and with singular sweetness and intelligence of expression. Her manners were gracious and pleasing—of great dignity and modest reserve. She appeared on horseback in arms at the head of her troops, and in contrast passed hours tending the sick in the hospitals, needle-work in hand. By this condescending and captivating deportment, as well as by her great learning and higher qualities, she gained an ascendancy over her turbulent subjects which no king could ever boast.

Artifice and duplicity were so foreign to her character and so adverse to her policy that when they appear in the foreign relations of Spain they are certainly not imputable to her. She

was incapable of harboring any petty distrust or latent malice. She seconded Columbus in the prosecution of his arduous enterprise, and shielded him from the calumny of his enemies. But the principle which gave a peculiar coloring to every feature of Isabella's character was piety. It shone forth from the very depths of her soul with a heavenly radiance which illuminated her whole character.

The dove had gone forth—it had found rest for the soles of its feet—it had brought back the olive branch. A great cloud had rested over the earth. In the dark cloud there shot up a flame, which spanned the heavens as a bow. It was the breaking forth of the light of the new era—it was the morning dawn after the night—it was the bow of promise—the art of printing, destined to throw its rainbow hues over the world forever. God had said: "I do set my bow in the clouds and it shall be the token of a covenant between me and the earth, and it shall come to pass when I bring a cloud over the earth that the bow shall be seen in the clouds. And the bow shall be in the cloud and I will look upon it that I may remember the everlasting covenant between God and every living creature of all flesh that is upon the earth."

It was a period of great expectation—the servants of the Most High looked with longing hearts and fervent hopes for deliverance from the tyranny overshadowing them. Sorrow and anguish had taken hold of them whilst discord, envy, malice and hate, in triumph said: "Where is now thy God?" "Why do the heathen rage and the people imagine a vain thing?" "The kings of the earth set themselves together and the rulers take counsel against the Lord and against his Anointed."

LUTHER.

When the fires were lighted at the feet of John Huss, the martyr, in a voice of prophecy he cried out: "You are going to roast a goose; in one century you will have a swan you can neither roast nor boil."

"But hark! what sound—out of the dewy deep,
How like a bugle's shrilled note
It sinks into the listening wilderness,
A Swan—I know him by the trumpet tone;

Winging his airy way in the cool heavens,
 Piping his midnight melody he comes.
 Celestial bird; at this mysterious hour
 Why on the wing with chant so wild and shrill?

"Now clearer sounds thy voice, and thou art nigh;
 From central sky thy clarion music falls.
 Oh what a mystic power hath one wild throat,
 Vocal, at midnight, in the depths of heaven.
 What soothing harmonies the trembling air
 Through the ethereal halls may breathe, that ear
 Which asks no echo—the eternal ear,
 Alone can list. But hark how hill and dell
 Catch up the falling melody. He comes,
 The dulcet echo from the hollow woods,
 Like music of his own; while lingering
 From misty isles, steal softest symphonies,

"Bird of the tireless wing, thou wilt not stoop;
 Thine eye is on the border of the sky."

To him, the liberator of modern thought, I owe the liberty to write and you to read. Martin Luther, the Swan of Eisleben—he, the mighty messenger of God, appeared, the bow of promise above his head, the open book in his hand, and with his foot upon the lofty mountain of his native land, and again upon the waters of the Mediterranean he inveighed with trumpet tones against the evil of the day, and declared the mysteries of the word and the speedy coming of the Lord—as he spake seven thunders uttered their voices.

Melancthon exclaimed, on looking at his picture, "Each one of thy words is a thunderbolt." Carlo Sadius says: "Thy words were those of an angel." Luther's own countryman, Heine, says of him: "He was not only the greatest, but the most German man of our history. He was at the same time a mystic dreamer and a man of action. He spoke, and rare indeed he acted also. He was at once the tongue and sword of his age. A cold scholastic, yet an exalted prophet, drunk with the word of God."

Michelet, the French historian, adds his testimony to that of others: "Luther was the RESTORER OF LIBERTY (note the words) in modern times. He courageously affixed his signature to that great revolution which rendered the right of investigation lawful to Europe. And if we exercise it in all its

plenitude at this day—the first and highest privilege of human intelligence—it is to him we are most indebted for it; nor can we think, speak or write without being made conscious at every step of the immense benefit of this intellectual enfranchisement."

When Luther, for his heresies, was called to Worms, he was urged by friends to have regard for his safety and not go into this danger. To this admonition his fearless soul cried out: "I shall go there if there are as many devils there as there are tiles on the roofs of the houses," and as he entered the ancient city he rose up in his chariot and broke forth in inspiring strain that Marseillaise of the Reformation, "A Safe Stronghold our God is still;" and a century later the hosts of Gustavus Adolphus—the liberator of Sweden—sang this as their warlike pean as they marched forward on the field of Lutzen.

In the great soul of Luther there was room for all things—passionately fond of music, his compositions bear no slight part in the perpetuation of his fame; a devotee of the muses, his poetry breathes forth the same inspiration which his words clothed. A complete man was Luther, and well has it been said by him, "Death—defiance on one hand and such love of music on the other—between these two all great things have room." Poetry and song were his especial delight, and the name by which he became known, "The Swan of Eisleben," was appropriately bestowed.

"Ah," he once exclaimed, "Were I a great poet, I would write a magnificent poem on the utility and efficacy of the divine word. I have read it twice a year; 'tis a great and mighty tree, each word of which is a branch. I have shaken them all, so curious was I to know what each branch bore, and each time I have shaken off a couple of pears or apples." "The word of God is the peculiar property of each individual of the community, and each one must interpret it for himself."

Speaking of the great discovery of his time, Luther says, "Printing is the best and highest gift—the *summum et postremum donum*, by which God advanceth the gospel. It is the last flame which shines before the extinction of the world.

Thanks to God that it hath come at last. Holy fathers now at rest have desired to see this day of the revealed gospel."

Again he says: "I saw a sign in the heavens—it was a beautiful rainbow, and I thought of the coming of Christ. I saw great and heavy clouds floating over my head, like an ocean. I perceived no prop which could sustain these clouds, still they fell not, but saluted us sadly and passed on, and as they passed I distinguished the arch which upheld them—a splendid rainbow—slight it was without doubt, and delicate, one could but tremble for it under such a mass of clouds. Nevertheless, this airy line sufficed to support the load and to protect us. There are those, however, who are alarmed at the weight of the clouds and have no confidence in their frail prop. They would prove its strength, and not being able, they dread the clouds will dissolve and drown us with their floods."

Like all true reformers, Luther was without fear. He believed himself to be under God's guidance, and prophetically does he say of himself: "I DO BELIEVE THAT I AM THAT GREAT TRUMPET WHICH PREFACES AND ANNOUNCES THE COMING OF OUR LORD. Therefore, weak and failing I may be, and small as may be the sound that I can make the world hear, my voice is in the ears of the angels of heaven, who will take up the strain after us, and complete the solemn call, Amen and Amen."

The legend of St. Martin is as follows: "St. Martin was one of the most popular saints or symbols of the middle ages. He was especially noted for his benevolence and charities to the poor. To him is imputed the destruction of paganism, to which end he went about throwing down altars, idols and images. There was once a time when the people worshiped a certain martyr and made pilgrimages to his sepulchre, over which they had raised a chapel. St. Martin believed that this faith was a delusion and a snare, so he went one day to the sepulchre and prayed that it might be revealed to him if any martyr lay there. Soon a dark form appeared and told the saint that he was a robber whose soul was in hell. Then the saint destroyed the chapel and altar as he did those of the pagans.

St. Martin's day has always been kept as a festival, a goose, the emblem of this saint, being the chief of the diet.

In England the day is called Martinmas tide. Luther was christened on November 11th, and called Martin.

CHARLES LATIMER.

RECOLLECTIONS OF THE PYRAMID.

The honest inquiry of the human soul is: "What is Truth?" On the pinions of astronomy men soar among the constellations of the heavens, if perchance they may be able to discover an answer to this question. Or, they dive down into the earth and ask the geologist for the testimony of the rocks, hoping to find a reply hidden away between the nicely fitting strata. Some in quest of truth bury themselves in the dusty volumes of forgotten lore, expecting that musty literature contains the inheritance; others await the ingenious developments of modern thought, and are willing to seize upon every new theory with the hope that it is the long looked-for Messiah that is to give an unequivocal [and transparent solution.

I believe in the evolution of truth,—not in the evolution of the Bible, for plagues and curses are awaiting those who add to or take from its precious words, but in the evolution of the truths of the Bible. This evolution has been going on since the man of Nazareth began to teach, and the unfolding process continues being dependent upon the mental, moral and physical development of man, and his personal and natural environments. Truth has sprung from the perfection of deity and evolves before us as we approach nearer and nearer to that human perfection which is enjoined upon us by the words, "Be ye also perfect even as your Father which is in heaven is perfect."

During the past year I have been a silent, but very much interested member of the Anti-Metric Society, because the exalted endeavor of the organization is to answer the mysterious inquiry, "What is truth?" I like the Society because it is scientific and mathematical. When I met our genial president

on the train the other day and consented to write something for the Magazine, it was understood that my paper was neither to be scientific nor philosophical, nor yet mathematical. Though of themselves, I am sure that my observations upon the Great Pyramid would be insipid and tasteless diet, yet possibly sandwiched between the thoughtful and studied productions of others, they will not be entirely devoid of interest.

A ninety minutes ride in an open European carriage from Cairo, through an avenue of lebbek trees, over a fine road built for the use of the Prince of Wales, during which we pass the decayed and filthy village of Gizeh, once adorned with magnificent palaces, brings us to the base of the Great Pyramid. As we emerge from the arbor of trees that has protected us from the burning rays of the sun, the venerable bequests of antiquity stand before us. Our first feeling is that of reverence, in which our whole being participates, but the next moment, with all the enthusiasm of an American boy, we have our hat off shouting three cheers for the Pyramid.

The pyramids of Gizeh occupy a plateau. The east and north margins are very precipitous at places.. The plateau is 1,600 yards from east to west and 1,800 from north to south. The three Great Pyramids are so situated on this plateau that a line drawn from the northeast to the southwest angle of the largest pyramid is exactly in a line with the diagonal of the second pyramid, while the diagonal of the third pyramid is parallel with that line. These pyramids are thus built exactly facing the four points of the compass, with an inclination as revealed by the magnet of $8^{\circ} 30'$ towards the west.

As we draw nearer to the Great Pyramid we are overwhelmed at the massiveness and apparent age of the yellow pile before us, and appreciate the words of the Arabian poet, who said :

"Everything fears time, but time fears the Pyramid."

Yet time has effected some changes, beside to some extent discoloring the stone. No trace of the incrustation can be found, though on the adjoining pyramids much of the incrustation, by which the sides preserve a smooth instead of a step-like surface, still remains. It is said that the stones used for

this purpose on the Great Pyramid have been carried into Cairo and used for building purposes. Just so are wise men gathering material from this wonderful link between the past and the present, by which the canopy of truth is being strongly supported and mightily strengthened. The sand has piled itself up more or less around the base of the Pyramid so that the under courses of stone are entirely hidden from view. We feel like hurling an anathema of excommunication against the ruinous and lonely old sphynx yonder, for not discharging the duty imposed upon it by the ancients, in protecting the Pyramid from the encroachment of the great ocean of sand. As we come still nearer we discover that the crumbling process of time has eaten away parts of many of the huge stones, especially the line of stones which forms the corners of the structure. Some of the corner stones are entirely gone from their places.

By the assistance of three muscular Bedouins, one at each hand and another behind "to boost," we succeed in reaching the apex of the Pyramid. The top is tunneled and is about thirty feet square, the even surface being broken by several large blocks of stone. The view here presented to the traveler is remarkable, unusual and thrilling. At our feet toward the east is Cairo, in the midst of the luxuriant palm groves of the Nile; in all other directions nothing but a desert waste—a vast interminable stretch of sand, dotted here and there with pyramids of various sizes. The step pyramid in Sokkard seems but a stone's throw, though it is a dozen miles away. One vast necropolis! The oldest graveyard in the world! We find ourselves wondering whose tombstone we are desecrating by standing upon it, when we suddenly remember that we belong to the Cleveland Anti-Metric Society, and hasten to descend that we may examine the interior of the mysterious structure. But not until we have given the lonely desert America's best greeting by singing "My country 'tis of Thee" and "Star Spangled Banner."

When we have descended to the thirteenth tier of stones on the north side (for all pyramids are entered from the north) and at a perpendicular height of forty-eight feet from the ground, we find the entrance. The displaced stones are lying around

in promiscuous confusion, creating the impression that no one has any interest in restoring this monument, rich in fact and history, from the destruction laid upon it by the ruthless hand of the avaricious treasure-seeker. As we enter and creep down the low passage, by the light of our flickering candles, we are amazed at the exactness with which the huge granite blocks, which form the facing of the passage, fit together. No genius of these modern days can excel the masonry of those ancient builders.

Twenty yards from the entrance our progress is arrested by a large triangular trap-door of granite, let into the ceiling and held to its place by iron clamps. The first Arabian explorers avoided this barrier, which was too hard to penetrate, by forcing a passage through the softer limestone, making a decided irregularity, the most awkward place in the whole route. A continuation to this passage downward leads to the subterranean chamber, now closed to travelers. After passing the jutting rock, we begin to ascend at about the same angle we had descended. We next reach the Great Hall, but before entering we diverge, and by a horizontal passage reach the Queen's Chamber. Nothing particularly attracts our attention here except in the floor of the entrance, where we descry at a distance of at least a yard apart, several round holes two inches in diameter, which seem to let in a little light upon the somewhat mooted question as to how the great stones were elevated to their places in the construction of the Pyramid. They might have been the resting places for derricks or hoisting apparatus.

We return and enter the Grand Gallery, which is true to the many descriptions with which you are familiar. In our ascent we are aided by the horizontal incisions supposed to have been made to facilitate the introduction of the so-called sarcophagus. The jointing and polish of the Mokattam limestone in the walls are marvellously exact and perfect.

We have now come to the passage leading into the King's Chamber. We pass under the granite leaf; in about the middle of the passage we are able to stand up, and just even with our head is the famous "Boss-Stone," precisely one inch in height.

It is now left for us to go a few steps further and we are in the grandest of all these hidden departments, the King's Chamber. The lidless chest is in one and cut from a solid piece of granite. A removal of the accumulated dust of centuries discloses the most exquisitely polished red granite walls. All through the revolutions of nations and the rapid flight of time, this inner chamber has retained its pristine splendor; and it seems as if from that upper room, reflected from those glistening walls, is to go forth a mighty power, which shall add luster to revelation and lend a ray of beaming light to our inquiry, "What is truth?"

We were particularly interested in examining the King's Chamber. In a conversation held with Mr. Latimer previous to our departure for Egypt, he said there had been quite a spirited discussion among some Cleveland gentlemen concerning whether or not the inner surface of the King's Chamber was polished. At his request we gave this point special attention and found the walls very highly polished. Any one who would take the trouble to rub away the dust which thickly covers the wall, could make no mistake in the matter. The polish is as fine and beautiful as that of the most elegant monument in Westminster Abbey.

It takes a long while to inject an idea into the heads of men. All the inheritances of antiquity have performed a particular mission. The poems of Homer, the statues of Phidias, the architecture of the Assyrian, have all assisted in raising to sublimity the heights of culture and refinement. The discovery of the Rosetta stone was an "Open Sesame" to the hidden glories of many centuries. Who is there that dare say that the mission of the Great Pyramid is any less than these? Dr. Johnson may say of his friend, "what did Lord Charlemont learn in his travels, except that there was a snake in one of the pyramids of Egypt," but protected by an omnipotent arm there stands to-day "a pillar in the border of the land of Egypt that it might be a sign and a witness to Jehovah of hosts," that is destined, when all its mysteries have been unfolded, to brightly illuminate truth, and not only stand as a stepping-stone back to antiquity, but as a stepping-stone to a fadeless futurity.

CHARLES EDWARD LOCKE.

* THE BALLARD THEORY OF PYRAMID SOLUTION.

Within a few months this new and striking solution of the Pyramid problem has won its way by sheer literary and scientific merit, probably to a permanent place in our special literature. For the most part the work is above ordinary criticism. And yet, in some of the main conclusions, there is so much which conflicts with views advanced by the highest authorities, and which, if too hastily accepted in the gross, might tend to unsettle important lines of thought, that, from our special standpoint a few brief inquiries may arise.

The leading positions of the theory seem to be, substantially : that *all* the pyramids of the Gizeh group and of the rest of Egypt are parts of a general plan; that their main and almost sole purpose was to serve as instruments for surveying the country according to a particular method ; that they were all built upon a very perfect special geodetic adjustment of the Royal Babylonian cubit ; that incidentally they were all developed according to a mathematical law from geometric stars—the five-pointed, six-pointed, seven-pointed stars, etc.—and that their geographic arrangements and very differences of type were alike necessary parts of the same scientifically devised plan.

Let it be understood, then, as being purely by way of inquiry in the interest of fair induction, more than any thing else, that I venture upon the following observations:

The geometry of the Great Pyramid is *general*. It so happens that the 'plethon' of the Greeks, (like our 100 feet chain) which Mr. Ballard, following Cassini, interprets as a second of arc applied to the polar circumference, was simply 100 feet—whichever foot might be used—and as a square it was 10,000 square feet ; and that it had from time to time as many different values as the foot had, or as the stadium had. Cassini

* The solution of the Pyramid Problem, or Pyramid Discoveries, with a new theory as to their ancient use. By Robert Ballard, Member Institute of Civil Engineers, England; Member American Society of Civil Engineers, etc., etc., New York: John Wiley & Sons. 1882.

wrote only 160 years ago, at a time when the Babylonian division of the circle was pretty generally in vogue, and it was easy to select a particular form of the plethon which would nearly match a second of arc. But it does not necessarily follow that a supposed Royal Babylonian cubit, so adjusted as to be 1·60 of such a plethon, or the Babylonian division of the circle, were used in building the pyramids or in the *ancient* work of the Egyptian surveyors; or that they appeared in Egypt until *after the Persian invasion*.

And in fact the very method of ancient surveying, which Mr. Ballard suggests—by models (analogous to our plane-table work)—and by the use of a variety of right-angled triangles with comensurable sides, obviating to a great extent the necessity of a circumferential division of the circle, as well as his development of the Cheops Pyramid from the pentalpha, which I have long regarded as probable, because it is so close an approximate index of the π ratio—all seem inconsistent with his theory. And again, the plethon came into Egypt *after the time of Alexander*. Further, as to the ancient land surveys, the operators must have used linear dimensions for details in the field. Now, nothing in ancient metrics is better established than the length of the schoenus, and the fact that it was the agrarian measure of the Egyptians down to and long after the Exodus.

And if we admit, for argument's sake, that the Royal Babylonian cubit *is* indicated in the structure of Cephren and Mycerinus, why, we may ask, was the base of Cephren taken at 420 such cubits, and that of Mycerinus at 210? Was it because the base of Cheops happens to measure 452 such cubits? And does it follow that the Royal Babylonian cubit is indicated in the dimensions of Cheops? And if it be true that the ground plan of arrangement of the entire Gizeh group is upon the triangles claimed, and that the ratios of half-base to apothem, etc., bear the asserted simple or complex relations to these triangles, does it follow that Cheops originally entered into this combination at all? Is it not equally consistent, at least, that all these relations, including the 20, 21, 29 triangle, were *after* arrangements, tagged

FIG. 1. EQUILATERAL FACED PYRAMID.
UPON 6 POINTED STARS.
APOTHEM = MH.

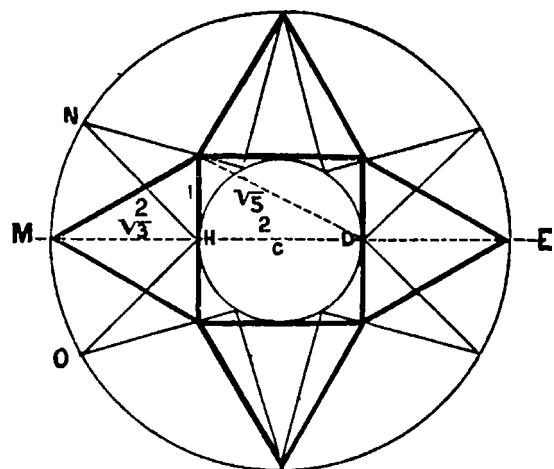


FIG. 2. CHEOPS.
UPON PENTALPHA.
APOTHEM = MH.

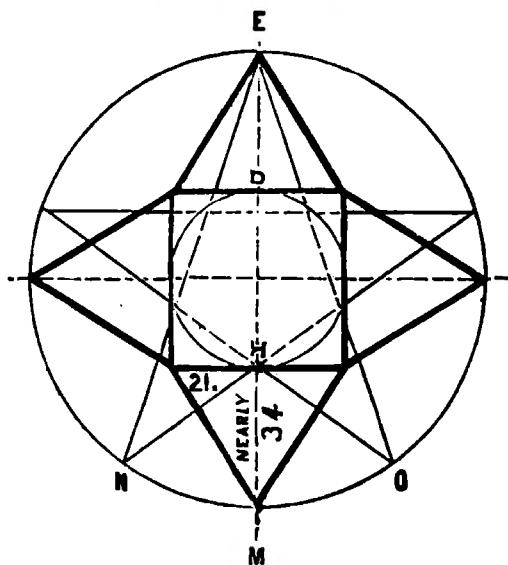


FIG. 3. CEPHREN.
COMPARED WITH 6-POINTED STARS.
APOTHEM $<$ MH.

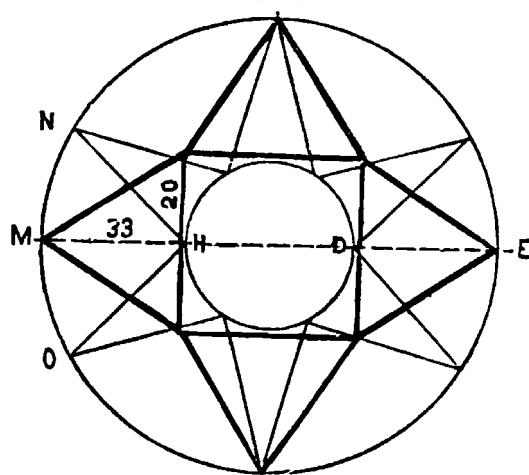
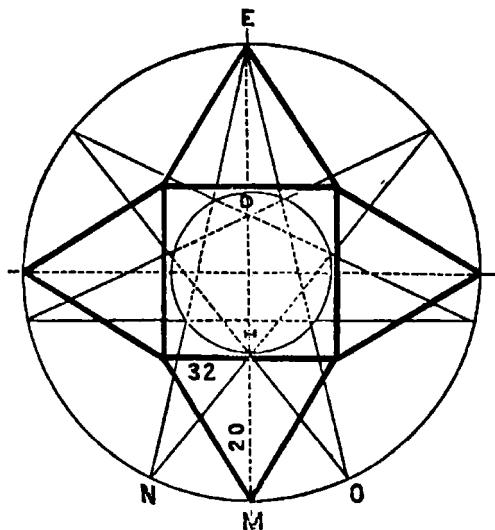


FIG. 4. MYCERINUS.
COMPARED WITH 7-POINTED STARS.
APOTHEM $<$ MH.



upon Cheops by builders who had lost, or rather never possessed, a knowledge of its plan and meaning? Mycerinus, and Cephren for that matter, were doubtless marvels of workmanship, but where is their plan?

I confess I may have misunderstood the general law of developing 4-sided pyramids from 'stars,' as stated by Mr. Ballard (*The Solution of the Pyramid Problem*, p. 103). After having shown how the Cheops model may be developed from a pentangle, he says: "Similar close relations to other stars may be found in other pyramids. Thus:—suppose NHO, of figure 69 (see figure 2 of diagram herewith) to be the NHO of a heptangle, then does NH represent the apothem, and NO represent the base of the pyramid Mycerinus," etc. This principle of connection is so different from that of Cheops with the pentalpha, that no general law can be inferred.

I understand the general method to be, that the square base of the Pyramid should circumscribe a circle whose circumference intersects the re-entrant angles of the star; that the vertices of the developed slant faces should lie in the circumference which passes through the points of the star; and further, that the angle of each point of the star should be half the angle subtended from the main center by any two points.

To test this I have drawn the diagrams to a radius sufficiently large to show any glaring discrepancies to the eye, without too much refinement in drawing.

Fig 1 is the development of a supposed equilateral faced pyramid upon a 6-pointed star or hexagon. Radius being = 1, the side of the square base is of course $\frac{1}{\sqrt{2}}$.

The triangle marked (to show its ratios) 1, 2, $\sqrt{5}$, is the key to extreme and mean ratio, and so to the pentalpha.

Fig 2 is a development of the Cheops model upon the pentalpha; radius, the half-base and the apothem are in extreme and mean ratio.

Fig 3 is a comparison of the Cephren model with a 6-pointed, and Fig 4, of that of Mycerinus with a 7-pointed star.

The discrepancies in the last two are so apparent that I omit their numerical and algebraic expressions.

We see at once that neither Cephren nor Mycerinus have a "guiding star;" and that generally, as to square-based pyramids, either the relations must depend upon the ratio of apothem to half-base, in which case the series is infinite and independent of the circle; or else if that ratio depends on the number of points of the star, the series is limited by the number of stars that can be formed: and specially, that there are but two stars—the six-pointed and the pentalpha—upon which relations can be developed which are geometrically simple, compact and satisfactory; and of these the pentalpha includes the other, and so becomes the symbol of perfection. Through the pyramid, it directly indicates the π ratio to within a close approximation.

And in fact the seven-pointed star is ungeometric. The arrangement of the *seven* lights is, as shown by Dr. Epstein (*International Standard*, September, 1883, p. 252), six at the angles of the hexagon, with the seventh at the center.

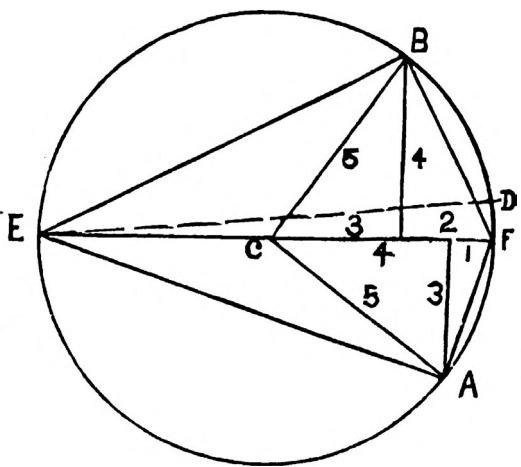
It is also apparent that, beautiful as a large number of the right-angled triangles with three commensurable sides are, and convenient for use in details, there is but one, the 3, 4, 5, or Pythagorean, which significantly points alike to general geometry and to circular relations in the simplest possible terms.

It is suggested, that to arrive at the simplest conception of the Pythagorean doctrine, only the number two, which properly represents a right angle, should be repeated as a factor. Accordingly, 4 (double of 2, and also its square) represents the tetragon or square figure, by the aid of which the Pythagorean theorem itself is ascertained; 3 represents the equilateral triangle and also the circle; 5, the pentalpha itself, which results from the other two; their sum represents the zodiac and the division of the year by months; $2 \times 3 \times 5$, the days of the month.

The square and the equilateral triangle applied to the circle result in the hour-angle; $2 + 3 + 5 = 10$ = the general modulus; 16 (the double cube of 2) gives all the main diagonals required; and $16 \times 3 \times 5 = 240$ points to the geometric degree, which results from the most rigid joint application of the square, the equilateral triangle and the pentalpha to the circle.

Perhaps the most remarkable property of the 3, 4, 5 triangle is shown by the diagram (Fig 5).

FIG. 5



Let the diameter of the circle, $EF = 10$. Apply the 3, 4, 5 triangle upon opposite sides of this diameter, in reverted positions. BCA is a right angle. Draw the chords EB , EA , BF and AF . The angle BEA is the octant, whose tangent is radius. By similar triangles we see at once that the angle BEF has its tangent $= \frac{1}{2}$ radius,

and leads to extreme and mean ratio, and to the pentalpha. The remainder of the octant, FEA , has its tangent $= \frac{1}{3}$ radius. Bisect the original quadrant BA in D , and draw ED , and we have the 1-16.

Now, while the 1-16 can be obtained by simple bisection upon the circumference, and the 1-240 in the same way from the 1-15, that construction does not disclose this peculiar composition of the octant, which makes it imperative, in the rigorous treatment of the circle, to resort to bisection here, and here alone. And there is no other form of the right-angle triangle, that I know of, that can thus be a key to all geometry, or can become, as this 3, 4, 5 triangle has always been, a pure symbol of excellence and power.

The division by 360 is less simple, and seems a somewhat arbitrary departure from ancient simplicity of conception. Doubtless much of the tenacity with which geometers cling to it is the effect of habit. Among its admitted conveniences it has the doubtful one that if we divide the degree and the day each decimally, days may be reduced to degrees by simply deducting about $\frac{5\frac{1}{4}}{365\frac{1}{4}}$ for each day of elapsed time. Sexagesimal subdivision increases the difficulty,

without apparent compensating advantages. And (apart from its convenient length) the Royal Babylonian cubit, however nicely adjusted, so far from being a natural measure, is every way as arbitrary as the French metre.

I have sometimes asked whether the ancient growth of geometry might not be traced through the types of American and Asiatic pyramids. Cheops is confessedly the oldest of the Gizeh group. It alone of them all is developed from the pentalpha. Cephren starts with a base equal to a section through Cheops at the same level. Mycerinus has a base side half that of Cephren. Each of the two has its separate empirical model. Admitting then again, for argument, the Royal Babylonian cubit as to these, yet keeping in view the political changes which culminated in the Exodus, may we not reverse the question, and maintain that, descending from Cheops, these later structures mark the *decay* of geometry? Was it here that the pentalpha—the key of the plan—the light of the capstone—was lost? Can it be—may it not be—that with the departure of Israel this “bright and morning star” of geometry vanished from Egypt?

JACOB M. CLARK.

INTERESTING COMMUNICATIONS.

[We take great pleasure in publishing the following paper from Professor C. Piazzi Smyth, prefaced by a letter from him to Rev. H. G. Wood, Sharon, Pa., which were received only a short time since:]—EDITOR.

PIAZZI SMYTH TO REV. H. G. WOOD.

ROYAL OBSERVATORY, EDINBURGH, Nov. 24, 1883.

Dear Sir: What thanks do I not owe to you, and through you to the International Institute of Weights and Measures, for most remarkable enclosures of November 10, *in re* Mr. Flinders Petrie's Royal Society's approved book, and its self-assumed destruction of the sacred and scientific theory of the Great Pyramid.

At the very time that I was engaged in this country, reading and reviewing the book, but only in the general manner of showing that even on its own account, when a few perversely twisted knots are taken out of its descriptions, the Great Pyramid stands very much as it stood before, and with some collateral points vastly strengthened,—at that very time you were engaged in overhauling just the most important numerical statements of the book, and taking them by appeal to extremest accuracy; and how often in science have not the grandest questions been settled by the testimony of some of the minutest elements and closest agreements concerned.

In this case, as in all other cases of mensurations, where in the modern scientific world, notable results have been published by scientists with limits of probable error attached—it has been found on the work being repeated by subsequent scientists, that their results have differed from their predecessors by much more than the probable error they had given as computed.

Hence I have no confidence in the probable errors given by W. F. P. being what would be found if, say, the much-wanted American expedition was to go out and remeasure his work,—unless we double or triple his error-amounts at least, and in that case, as you have so well shown, a socket base-side of the Great Pyramid measures by his numbers just what we have all along concluded it must have been intended by its primeval architect to show us in these latter days. Moreover, whereas I had remarked, in reading the book, that he fought rather shy of tackling the *angles* of the passages, it is just there where you have gained the most sweeping agreements between your high theoretical conceptions and my observations of the ancient builded facts, observed, I may add, with such fine clinometrical instruments, and under such satisfactory conditions, that I considered at the time their life's work was accomplished worthily, and have them still in the library here as witnesses to what they did then.

Be so good as to forward the enclosed acknowledgement to the International Institute, and believe me to remain,

Yours very truly,

C. PIAZZI SMYTH.

PIAZZI SMYTH TO THE INTERNATIONAL INSTITUTE.

Gentlemen :—I have the honor to acknowledge receipt, per committee represented by Rev. H. G. Wood, Sharon, Pa., of a copy of the resolution you came to, at your annual meeting on November 8 last, after hearing that gentleman's careful examination and high scientific criticism of just the most crucial portion of W. Flinders Petrie's book on "The Pyramids and Temples of Gizeh."

While I was quite aware there was much in that book covertly intended for my particular confusion—but which I trusted to be quite capable of withstanding—I could not but regret that it had been arranged also to confound many other persons who, in various countries, have listened favorably for

several years past to what I have had to say of the Great Pyramid—not by my own invention or discovery, but on the lines of both religious origination and scientific respect to its unknown architect, commenced by the late John Taylor, Gower street, London, most worthy and admirable persons all of them, exemplary too in carrying the *mens sano in corpore sano*, as Christians as well as scientists, but who have not enjoyed such large opportunities as have been granted to me for ascertaining at the place how very much more testimony there is for us than against us.

In this particular emergency, how relieved I have been to find that the men of the United States—among whom the book was thrown, at its simultaneous publication in London and New York, like a bombshell, to disturb them—have instantly helped themselves, in the shape of holding a discussion at a public meeting, commenced with prayer, in the hall of their most earnestly striving “International Institute for Preserving and Perfecting Weights and Measures.”

That Institute, though but four years old, having had more papers already before it on the Great Pyramid than any other scientific society in the world, was efficiently qualified to discuss the new work at once, as well as to compare the mentally elevating theories of the Rev. H. G. Wood with the depreciating ones of W. F. Petrie, and they did so, with this remarkable result, too, of finding—

(1.) That W. Flinders Petrie’s book is an attempt to throw discredit on those Pyramid investigations which I have been carrying on for the last eighteen years, in continuation of the ideas received from John Taylor, when he was called away from his usefulness in this world at the grand old age of eighty-three.

(2.) That the result of the Rev. Wood’s able analysis of both sides of the case has not only strengthened the Institute’s confidence in the accuracy of my work, but discovers “in W. F. Petrie’s measurements the material for substantiating the confidence reposed in me.” Wherefore they, as well as I too, may deservedly thank the Rev. Mr. Wood for this unlooked for so speedily bringing out of—as they are pleased with happy

point to phrase it—“the unwitting confirmation which W. F. P. has given to Prof. Smyth's theoretical measures of the exterior of the Great Pyramid.”

But there is another point on which I am yet more particularly bound to thank the International Institute for what it has found in its heart to do on the present occasion, for this mischief-intending work of W. F. P. was published in London, not on its author's merits alone, but under the patronage of the one Society there which combines so much wealth, Government subsidies, executive patronage and social influence, as to have become in a manner dangerously autocratic to the liberty and conscience of the scientific and literary citizens round about it.

This Society is by name, not as the Institute's document by an accidental slip has in one place stated, “The Royal Astronomical Society,” but “The Royal Society.”

Now, said Royal Society not only yields far too much of those tempting powers to the souls of its own members above alluded to, but it has been distinguished by acts both of will and of fate, as being possessed by a sort of hatred and undying opposition to the Great Pyramid's sacred and scientific theory for years and years. Thus :

In 1859, it rejected John Taylor's first Pyramid paper.

In 1864, when I went out to Egypt to measure the Pyramid *in situ*, and was in the utmost straits for funds, the Royal Society, which is in receipt of a large annual grant from the Government for the assistance of precisely such special efforts in science, not only gave nothing to my semi-pauperized expedition, but actually sent back part of that year's grant to Government on the plea that there was nothing going on that needed it.

In the autumn of 1871, when I made a direct request for assistance towards a second expedition to the Pyramid then contemplated, the council extinguished the application at once, without waiting for the February meeting, at which all such claims that have come in through the year are usually held over to be discussed and adjudicated upon.

Lastly, in 1874, the Royal Society printed in a paper on the

Ordnance Survey of Great Britain some quite needless, most erroneous and exceedingly derogatory views of the Great Pyramid, by Sir Henry James, who had never seen it. And when I pointed out the several gross errors, and also sent direct observations and measures of the parts of the Pyramid concerned, the Society refused to let them appear in either of their two serial publications, in both of which the improper documents had figured. Wherefore, then I recognized only too clearly that there was nothing left for me—at that time a Fellow of the Royal Society—but to come out from amongst them and bear my testimony elsewhere, as I have been doing—though I fear with nothing like the zeal and power which the cause deserves—ever since.

So when I heard a few months ago of that Society having voted money assistance to bring out an author's Pyramid book, I was at no loss to guess, though its councils be flagitiously secret, what kind of views that book would advocate; and trembled to think how many innocent, confiding persons would accept and be misled by them; simply because brought out under the patronage of the worldly and socially overpowering "Royal Society."

Shame, however, to me, that I lost faith even for a moment in the progress of a cause originated by divine inspiration in the beginning of the world, and intended prophetically to come out in these times wherein we live and the coming times. For if some individuals on this side of the Atlantic have been too ready to quail before, and yield to, the mighty Society in London, and are gone—see how the "International Institute for Preserving and Perfecting Weights and Measures" has been raised up in America! Raised up there, among new surroundings of purest liberty, not only to declaim against that virtual bribery of Anglo-Saxon Britons to use French metrical weights and measures, which is carried on in the transactions of the Royal Society unceasingly,—but to meet that body openly in public discussion the very instant it comes out, in aggressive interest, with a Pyramid book after its own devices.

Best thanks therefore once again, gentlemen of the International Institute, for the generous and true resolutions you

came to at your annual meeting of November 8, and long may you continue to lead and instruct, not only the people of the United States, but "all the Israel of God."

I am, gentlemen, your obedient, humble servant,

C. PIAZZI SMYTH,

Astronomer Royal for Scotland.

15 Royal Terrace, Edinburgh, Nov. 24, 1883.

THE BRITISH MILE.

III.

In the September number of this Magazine we demonstrated that the semi-polar axis of the earth equals the height of a curtate cycloid, whose generating circle has a radius of 63,360 feet (5280×12), and whose base is the equatorial diameter of the earth. The semi-polar axis thus obtained is 20,854,101 feet. One ten millionth of this is 25.0249212 inches, which multiplied by 365.24224, the number of mean solar days in the tropical year, gives 9140.158 inches. This is within .02 of an inch of the theoretical base side of the Great Pyramid, according to Professor Smyth's computation.

It is important to any theory founded upon a geometrical construction of the Pyramid to determine accurately its base lines. Hitherto, so far as I know, a base plane has been assumed, either at the level of the pavement surrounding the structure, or at some inches, more or less, below. The point we have now reached in this discussion is that the true base lines should be very close to 9140.15. Let us see what facts are found in the building itself to sustain this view.

Within a few years four corner sockets have been uncovered, situated in two vertical planes intersecting each other, apparently at right angles, in the plane of the base. They are cut in the natural rock from four to twelve inches deep. The floor of every socket is well leveled. In area they range from thirty to one hundred and fifty square feet, designed evidently to mark the four corners of the building. So nearly do the lines

of the socket sides conform to a square base, that it would be difficult, without instrumental measurements, to detect the discrepancy. But if a line be carried around the base, connecting

Fig. 1

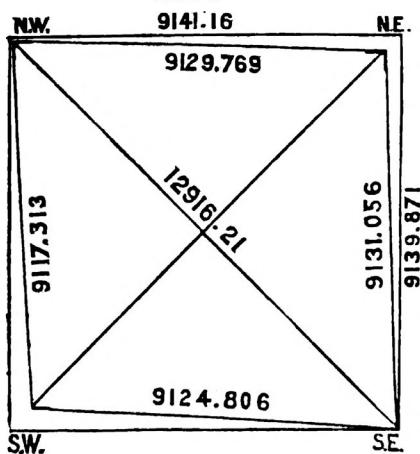


Fig. 2*

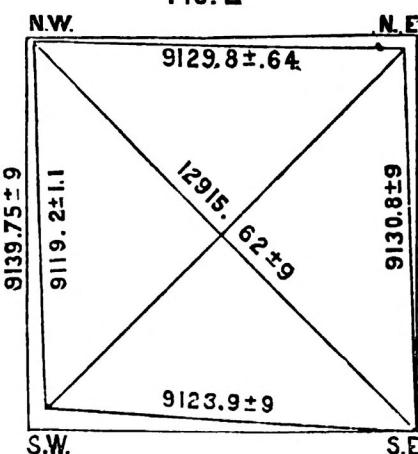
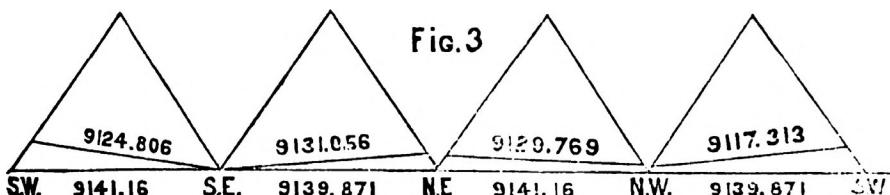


Fig. 3



the outermost corners of the sockets (Figs. 1 & 2), it will not form a true square. The diagonal, reaching from the southeast to the northwest corner, will exceed the other diagonal by more than twenty inches.† The distances between the corners, computed by Mr. Petrie, in inches Fig. 2, are as follows: The east socket-line, 9130.8; the north socket-line, 9129.8; the west socket-line, 9119.2; the south socket-line, 9123.9. To a casual observer, there is apparent an intention to set the structure true to the meridian of the locality.

As we examine the sockets more carefully in relation to one another, we find that the southeast socket is the lowest. The floors of the others in relation to it are higher, as follows: the northeast, 11.4 inches; the northwest, 7.1 inches; the southwest, 16.9 inches. These also are Mr. Petrie's measures.

* In Fig. 2 the decimal in each case after the plus or minus sign should be .65.

† The skew shown by the socket line in Figs. 1, 2, and 3 is greatly exaggerated in the diagram to illustrate what could not be seen in scale.

Some changes appear to have taken place in their levels during the past four thousand years. The opening of masonry joints in the interior of the building seem to bear witness of a settling towards the south and southwest. But taking the four socket levels as they now stand, we may ask—why did the architect lay out his edifice in this strange, unsquare manner? The superior skill and workmanship elsewhere exhibited, forbid us to suppose that the irregularity, both in foundation and corner levels, is the result of accident or carelessness; neither could it have been a freak of economy. We find it difficult to escape the conclusion that the diverse levels of the sockets, and the varying distances between them, express the architect's intention. What was it? What could he mean by setting his corners and stretching his foundation lines out of level and askew?

It is possible that, in the following argument, conviction may not result from the evidence; but the close and manifold coincidences make it exceedingly difficult to disprove design. We may safely leave it to the common judgment of men to say whether the coincidences are accidental or even the result of carelessness.

While Mr. Petrie gives some admirable measures, he does not seem to have allowed due importance to the accuracy of the socket cuttings. It is not a little remarkable that the sockets themselves were covered with a pavement from twenty to thirty inches thick. Whether the covering was designed for their protection, we cannot say, although it has served this purpose wonderfully well.

The east socket-line given by Mr. Petrie is the longest, measuring $9130.8 \pm .65$ inches. We have already shown that the true base line should be very close to 9140.15 inches. Mr. Petrie's measure is more than nine inches too short. What does this mean? Is theory at fault? Does Mr. Petrie's fact prove that the Pyramid architect saw no connection between his work and the form and size of the earth? Let us see.

The geometrical base of a pyramid is a plane, perpendicular to its axis, and passing through the point farthest from the axis. The southeast socket is this point. All other sockets are

nearer the axis, according to their elevation above the southeast corner. Mr. Petrie found the northeast socket 11.4 inches higher than the southeast socket. He gives the angle of altitude of the casing stones as $51^{\circ} 52' \pm 2'$. Now if the north face be carried down, at this angle, to the level of the southeast socket, (Fig. 3) it will strike the level base line 9139.75 inches from the extreme corner of the southeast socket. Add to this about one-third of the $\pm .65$, which Mr. Petrie allows for errors in triangulation and socket boundary, and we have a base line 9139.871 inches on the east side, at the level of the lowest socket. To take this as the length of the east baseline is perfectly in accord with Mr. Petrie's measures and the principles of geometry.

What is the north base line? Mr. Petrie gives us the following estimate of the original finished sides, at the level of the platform or pavement surrounding the Pyramid: north side, 9069.4, south side, 9069.5, the mean is 9069.45; east side, 9067.7, west side, 9068.6, the mean is 9068.15. The ratio of the means is thus expressed, $9068.15 \div 9069.45 = .99985 \pm$. The ratio is the same at any other level. It thus appears that the base plane is longer east and west than north and south, and that the ratio of its length to its breadth is the same as the ratio of the major to the minor axis of the earth's orbit. Taking for the east base line 9139.871 inches, we have for the north base line 9141.16 inches. While this difference may explain the fact that the diagonals of the base are not perpendicular to each other, it cannot affect any theory grounded upon a vertical section running north and south through the apex of the Pyramid, and having a base line of 9139.871 inches. However, it is quite within the limits of error allowed by Mr. Petrie to assume a square base of 9139.871, or a rectangular base (a conjecture that may need verifying) 9139.871 by 9141.16 inches.

Let us return to the socket lines, Fig. I. What do they express? First the east socket line. The tropical year in mean solar days is 365.24224. One fourth of one hundred years is 9131.056. Mr. Petrie's measure of the east socket line differs from this by only one-fourth of an inch $\pm .65$. May we say that

this east socket line records the exact number of days in a quarter of a century?

Take the south socket line. In the common reckoning of time the calendar year is 365 days, with one day added every four years, to make up the loss of the omitted fraction .24224. In one hundred years we have twenty-five, more nearly 24.25 leap years. Deduct 25 from 36524.224. The remainder is 36499.224. One fourth of this is 9124.806. Mr. Petrie's measure of the south socket line is $9130.8 \pm .65$. May we say that this line marks the number of non-intercalary days in a quarter century?

Take the north socket line. The minor axis of the earth's orbit equals the major axis multiplied by .9998591. Multiply the east socket line 9131.056 by .9998591, the product is 9129.769. Mr. Petrie's measure of the north socket line is $9129.8 \pm .48$. May we say that the north socket line was taken from the known eccentricity of the earth's orbit?

Take the west socket line. The minor axis of the moon's orbit in relation the centre of the earth equals its major axis multiplied by .998495. Multiply this by the number of inches in the east socket line, the product is 9117.313. Mr. Petrie gives the length of the west socket line 9119.2 inches $\pm .7$ for possible error in triangulation, and the additional error of $\pm .45$ resulting from the uncertainty of the socket boundaries, a total possible error on the west side of ± 1.15 . But from his azimuths, and the northwest to southeast diagonal, obtained from his north and east socket-lines, the west socket-line would be 9117.6. May we say that the west socket line was taken from the known eccentricity of the moon's orbit?

Let us now take these theoretical lines and lay them upon the sloping faces of the Pyramid, beginning at the southeast corner, Fig. 3, and taking this corner as the base of levels. The east socket-line 9131.056 would strike the sloping northeast corner of the Pyramid at the level of 11.22 inches above the southeast socket floor. Mr. Petrie places the level of the northeast socket at 11.4 inches. The south socket line 9124.806 would strike the southwest sloping corner at the level of 20.82 inches above

the southeast socket floor and the north and west socket lines, 9129.769 and 9117.313, would meet in the northwest sloping corner within one inch of each other. Mr. Petrie gives 16.9 for the difference of level between the southeast and southwest sockets. Here is a discrepancy of four inches between fact and theory. Our theory would imply a settling of the southwest corner to the amount of this discrepancy. Two evidences of settling are found. First in the pavement. Mr. Petrie found the pavement line, on the north side by the casing stones, nearly level from end to end. But midway on the south side it is 5.6 lower than on the north side. And on the west side, midway between the corners, it is 1.7 inches lower than the east side. This is a strong evidence of a settling on the south side towards the west end. Second, in the King's Chamber. Prof. Smyth found the east and west walls tilted towards the west, and the north and south walls tilted towards the south. The mean tilt is 6' 6". The walls show a fissure near the southeast corner. Every one of the huge stone beams that form the roof of the chamber is broken and the floor twisted. Considering that the levels of the north and east pavement are but slightly untrue, we may infer that the settling began somewhat south and west of the axis and extended in the direction of the northeast and southwest corners. This would allow for a radial line of settling somewhat more than one-fourth of the diameter of the base. A change of 6' in the level of a base line 2.500 inches long makes a difference of 4.37 inches. While this view of settling appears to account for the difference in the levels of the pavement, it also gives reason to believe that the southwest corner socket was originally not 16.9 inches but very near 21 inches above the level of the southeast socket. Theoretically it should be 20.8 inches higher than the southeast, and the southeast should be about half an inch above its present level.

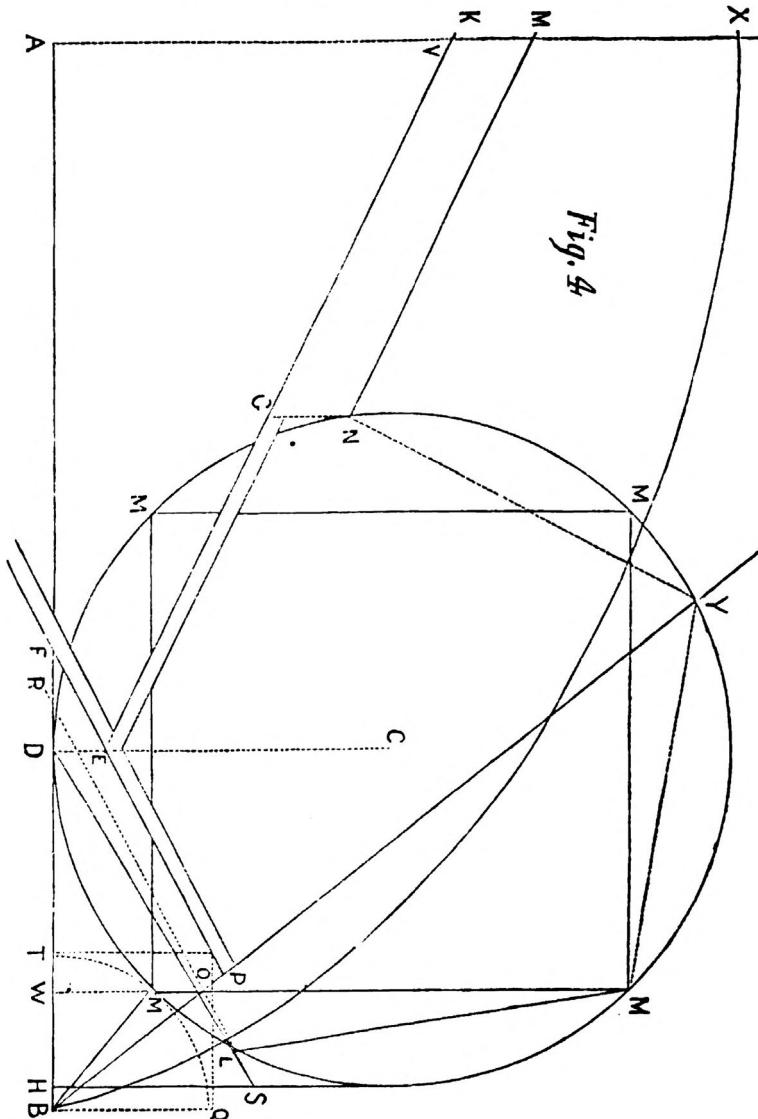
While we suggest the foregoing interpretation of the socket lines and levels we do not forget the bearing that angular measurements have upon the truth of theories. With the exception of the angle subtended by the west side, the differences barely exceed the limit of error allowed in Mr. Petrie's compu-

tation. The sum of the four theoretical socket lines we have presented is 36502.944 inches. The sum of Mr. Petrie's measures, allowing 1.6 inch for error in computing the west side is $36502.1 \pm$ an average error of more than half an inch on a side. The theoretical diagonal from northwest to southeast socket corner is 12916.21 inches. Mr. Petrie's measure differs from this by .59 \pm .9 of an inch.

These coincidences are at the least remarkable. That they are related to the design of the architect, we perhaps cannot farther demonstrate. The probability that they are accidental diminishes in a geometrical ratio as the number of them increases.

We proceed now to apply the properties of the cycloid to some other measurements of the Pyramid. The diameter of the generating circle of the cycloid, whose base is 9140.15 inches, is $9140.15 \div \pi = 2909.4$ inches. Twice this diameter is 5818.8 inches. In a pyramid whose base is 9140.15 inches square, and altitude 5818.8 inches, the vertical angle of base and sides is $51^{\circ} 51' 14.3''$. Wherefore, by the cycloidal theory of the construction of the Pyramid, as here developed, we have 9140.15 inches for the extreme base side, and 5818.8 inches for the extreme height. A vertical section of a pyramid, through its vertex and at right angles to one of its sides, is a triangle. Let the base of this triangle be 9140.15 inches, and the altitude 5818.8 inches. Let a circle whose circumference is 9140.15 inches be set on the end of the base and rolled along till the line that connects the point L, Fig. 4, describing the cycloid, and the point of contact between the circle and the base line, makes, with the base line, the angle BDL $29^{\circ} 58' 42''$. The latitude of the Pyramid is $29^{\circ} 58' 51''$ with a possible change of $56''$ in 4000 years. In this circle draw an inscribed square having one side parallel to the base of the triangle. One side of this square intersects the hypotenuse of the triangle at O. Produce the line DL till it meets the side of the circumscribed square at S, and draw SO. This determines the altitude of the passages of the Great Pyramid, $26^{\circ} 19' 34''$ nearly. Mr. Petrie gives the altitude of the axis of the entrance passage, $26^{\circ} 26' 42' \pm 20''$, and that of the ascending passage and gallery together, $26^{\circ} 12' 50''$; the mean of these is $26^{\circ} 19' 46'' \pm 20''$. Supposing the latitude of the Pyra-

mid to have been $29^{\circ} 58' 46'' \pm 5''$, the difference $3^{\circ} 38' 56'' \pm 20''$ between the latitude and mean passage was the apparent polar distance of Alpha Draconis, as seen through the telescopic passages of the Pyramid 2140, B. C. If it was the intention of the architect to produce a reflecting telescope, he would



naturally have made the altitude of the entrance and ascending passages the same. Here, again, is found reason to believe that settling southward to the extent of about 6' has taken place. The effect of such a settling would be to change the

altitude of the passages, increasing that of the entrance passage by about 6', and lessening that of the ascending passage and gallery by the same amount. It would also increase the horizontal distance between the beginning of the basement sheet and the south wall of the gallery by about 3 inches. It would also lower the level of points along the passage floors, and the more as the distance from the entrance increases. And this is just what the modern measures show in relation to the level of the southeast socket floor. The altitude of I, the beginning of the basement sheet of the entrance passage, is equal to the line MB drawn from the foot of the triangle to the nearest corner of the inscribed square. It is 652.91 inches. This agrees with Mr. Petrie's altitude of the beginning of the basement sheet above the level of the southeast corner socket within half an inch. The horizontal distance of this same point from the north base line (at the level of the southeast corner socket) is 652.91 inches. The length of the basement sheet from this accurately fixed beginning I to the line of the floor of the ascending passage E is $(10\pi)^2 = 986.96$ inches. Mr. Petrie and Prof. Smyth give it as 986 or 987 inches. It will be observed that in our scale of measure we have used the British inch and British feet interchangeably, and the British mile of 5280 feet. From the relation of the inch to the foot and mile thus exhibited in pyramid lines we conclude that the architect used these measures in laying out his work.

The following theoretical lines in Fig. 4 may be of interest: $2 AB = 9140.15$ or 9139.871 ; either measure as well as those given below will come within the limits of error allowed by Mr. Petrie. AX = one-half the height of the Pyramid; $WB = 50\pi^2 = 493.48$; $IE = (10\pi)^2 = 986.96$; $EG = (100\pi)^2 \div 8^2 = 1542$, the floor line distance from the floor of the entrance passage to the intersection of the overhanging plane of the north wall of the gallery with the floor of the ascending passage; $GK = 600\pi = 1884.95$. The meeting of the generating circle, the gallery, roof and wall, in the angle of the inscribed pentagon at the point N may suggest some connection between geometry and the law of pyramidal construction.

We have not yet discovered the whole truth of this marvel

ous edifice. Although it has been terribly shaken and wrenched, and men may criticise some of its distorted lines, it cannot reasonably be denied that the architect had a wonderful knowledge of astronomy, geology, and pure mathematics.

H. G. WOOD.

* BIOGRAPHY OF SIR JOHN HERSCHEL.

John Herschel was born at Slough, on March 7, 1792, in that house which his father's discoveries have rendered historical. What sort of intercourse passed between the father and the boy may be gathered from an incident or two which he narrated as having impressed themselves permanently on the memory of his youth. He once asked his father what he thought was the oldest of all things. The father replied after the Socratic method, by putting another question: "And what do you yourself suppose is the oldest of all things?" The boy was not successful in his answers, whereon the old astronomer took up a small stone from the garden walk: "There, my child, there is the oldest of all the things that I certainly know." On another occasion his father is said to have asked the boy: "What sort of things do you think are most alike?" The boy replied: "The leaves of the same tree are most alike to each other." "Gather, then, a handful of leaves from that tree," rejoined the philosopher, "and choose two that are alike." The boy failed but he hid the lesson in his heart, and his thoughts were revealed after many days.

These incidents may be trifles, yet we can trace therein: first, that grasp and grouping of many things in one, implied in the stone as the oldest of all things, and, secondly, that fine and subtle discrimination of each thing out of many like things, as forming the characteristic features of the astronomer's philosophy. He was sent in due time to Eton, but his mother saw him maltreated by a stronger boy and he was removed from the great school and educated at home. The success of that education is written in the volumes and the manners of his life; for John Herschel became in every way an accomplished man; he was a good scholar, an excellent modern linguist, a musician, and accomplished in the literature of the day. He has stated, however, that though he learned Euclid accurately and diligently, "he knew no more of its real bearing and intention than he knew of the man in the moon."

At the early age of seventeen he was entered at St. John's College, Cambridge. That college was then conspicuous for the careful and judicious training of its younger members in every branch of academical learning. He graduated as the senior wrangler of his year. Peacock, afterwards Dean of Ely, was the second on the list, followed by others who became conspicuous in their day.

One of Herschel's first works, after taking his degree, was to render the magnificent methods and results of mathematical analysis, so long familiar to the minds of foreigners, accessible to the English student. In conjunction with two of his university friends, he translated the best elementary treatise of that day on the "Differential Calculus," adding thereto a valuable appendix on the cognate subject of "Finite Differences," from his own pen. Not long after the same zealous mathematicians added a collection of examples and methods of the higher forms of analysis, which utterly revolutionized the form of mathematical science, not at Cambridge alone, but throughout the country. It was mainly by the writings of Herschel and Babbage that the foundation was laid for the brilliant school

* Abridged from Rev. Charles Pritchard's Biography of Sir John Herschel.

of English analysts, who are now, at least, the equals of their compeers on the continent.

His first communication to the Royal Society is dated from Slough, October 6, 1812. It related to "Some Remarkable Applications of Cotes' Theorem." In 1814 he communicated a second paper, in his own right, as a fellow of the society. It is a paper of suitable conception, entitled, "Considerations of Various Points of Analysis." It is in this paper that he first discloses the true bent of his maturer mind. He says: "Henceforth the attention of the scientific observer must be directed to those elevated stations from which distinct and extended views of the arrangement of mathematical science as a whole can be obtained." This grouping of things together as a whole constituted an eminent characteristic of Herschel's philosophy.

Soon after his degree he quitted Cambridge and placed himself in the hands of a distinguished Chancery barrister in London, with the view of qualifying himself for practice at the bar. But a mind constituted like Herschel's, and trained as his had been in the love of generalization, was not likely to submit voluntarily to the mastery of isolated facts and precedents bound together apparently by no ties of a general law. Whether this was the cause or not, certain it is that he emancipated himself from studies which were essential to success at the English bar.

Yet his removal to London proved to be the turning point of his scientific career, for there he made his acquaintance with Wollaston and South. Wollaston fascinated him by the breadth and accuracy of his scientific pursuits, and fostered, if not awakened, in him that dormant taste for chemistry and general physics, which wanted but the magic touch of such a mind to kindle into the intellectual passion of a life. He has said that he became an astronomer through a loyal desire to reexamine and complete his father's work. Had he followed simply the natural bias of his mind, his pursuits would have been the study of chemistry and of the theory of light. Hence it is that in 1818 we find him communicating to Nicholson's *Philosophical Journal* a very remarkable article on hyposulphurous acid and its compounds. He therein details the cardinal discovery of that property of hyposulphite of soda, which, had it been known to Wedgewood or Davy, would have anticipated the photographic invention of Nièpce and Daguerre by a quarter of a century. This was immediately followed by his first paper on physical optics. Then, in the same year, there is a communication made to the Royal Society on another optical question. He investigates the colored lemniscates, produced by certain biaxal crystals, when submitted to the passage of polarized light, and he proposes certain simple and elegant devices for the observation of these and similar gorgeous phenomena, sometimes adopted even in the present day.

Lastly, there came a very important paper, addressed to the Royal Society, on the subject of aplanatic combinations for the object glass of a telescope.

It was about this time that the influence of Mr. South produced a decided effect upon his pursuits. That gentleman had a passion for practical astronomy; he was possessed of some of the best achromatic telescopes of the day. It was a happy circumstance for him and for science that he could be associated with such a mind as Herschel's. Their conjoint labors commenced about the same time as the first formation of the Royal Astronomical Society. The venerable Sir William Herschel was its first president, and his illustrious son its first Foreign Secretary.

Herschel's first communication to the Astronomical Society related to the occultations of fixed stars by the moon; and the second to the arrangement of tables for the reduction of certain stars to their mean places at an assigned epoch.

From 1821 to 1823 he was associated with Mr. South in the re-observation of the double stars discovered by his father. The result of their joint labors is printed in the transactions of the Royal Society, and their importance and success were acknowledged by medals from that learned body, and subsequently from the Astronomical Society, and by the Lalande medal of the French Institute.

The conjoint labors of the two astronomers came to an end by the removal of South to the neighborhood of Paris.

Meanwhile, after the termination of his travels of Europe, Herschel resumed at Slough the self-imposed and gigantic task of reexamining the double stars and nebulae which, through a long life, had formed the solicitude of his illustrious father. After referring to the instruments employed, he says : "It will now be right to mention the modification I have introduced into my father's system of sweeping—modifications rendered necessary by the loss of my aunt's personal assistance, Miss Caroline Herschel, on whom the task of reading and registering the polar distance and right ascension of objects, writing down the remarks and descriptions, warning the observer of expected stars, and finally reducing and calculating the whole, used invariably to devolve. Unsupported by such aid, I am under the necessity of recording the observations myself: an inconvenience of the worst kind, not only as it diminishes by at least one-half the number of the objects that can be taken, but because the frequent admission of extraneous light to the eye is fatal to observations of the fainter nebulae."

We would earnestly recommend those who are interested in the history and progress of science, to read the introduction to such memoirs as those of the two Herschals and of other great astronomers of half a century back, to know how deeply modern observers are indebted to the ingenuity of their predecessors. The smooth, automatic motion of the magnificent astronomical machines of modern days, leaving both hands at liberty for adjusting the exquisite micrometers provided by the great artists of our day, will be all the better appreciated if they will watch and reflect on the comparatively clumsy, harrassing and laborious, though efficient, expedients necessarily adopted by the two Herschels. It seems indeed to be an inevitable law imposed on the achievement of all great work, and on all great discoveries, that they shall be completed under disadvantages.

In 1827, we find John Herschel occupying the chair of the Royal Astronomical Society ; and now commenced that series of presidential addresses, which we do not hesitate to say are unrivalled for instructive eloquence, masterly arrangement and comprehensiveness of view.

In November, 1833, he left England with his family to pursue his astronomical observations at the Cape of Good Hope.

The vast mass of scientific labor completed during the next four busy years at Feldhausen may be described by a rapid summary of the principal contents of the volume of the *Cape Observations*. It was not published until 1847, nine years after the author's return to England, for the very cogent reasons assigned by himself. "The whole of the observations, as well as the entire work of reducing, arranging and preparing them for the press, has been executed by myself." The first chapter of the volume records the history of the observations of the Southern nebulae and clusters of stars. They are then systematically arranged in a catalogue, containing the places of 1,707 of these objects, all reduced to the epoch of 1830, and each object bearing, in condensed literal symbols, a complete description. His delineations and descriptions of the great nebulae of Orion, and of the region surrounding the remarkable star of Argus, will long remain among the most remarkable of astronomical monographs. In a minute portion of the heavens, scarcely exceeding twice the space occupied by the moon's disc, there are recorded the places of no less than 1,216 stars. A spangle viewed at arm's length would eclipse the whole ; yet he himself acknowledges it was the anxious work of several months.

The catalogues and charts are no sooner completed than he proceeds to discuss questions connected with them. He inquires into the law of the distribution of these wonderful masses of glowing vapors, and these clusters of luminous suns. The nebulae being at length dismissed, he proceeds to detail his observations of the double stars which had presented themselves during the sweeps for nebulae. They are not dismissed until a

regularly arranged catalogue of all that he had observed was completed, and ready for comparison by any subsequent astronomer.

In the course of the chapter, Herschel makes one of those characteristic remarks which, while they enliven the narrative, serve for us a still higher purpose ; they exhibit the perseverance and the self-denial of the observer. He is referring to certain small regions of the heavens which are barren of interesting objects, and he observes that it was well for himself to enter some remarks in his note book "for the homely purpose of avoiding sleep, and that not unattended with the probability of broken bones."

Then comes a chapter upon Halley's comet, containing many interesting observations on the physical features and dynamical action of cometary matter.

Such is a bare and imperfect outline of the contents of this impressive volume. In perusing it we can with difficulty persuade ourselves that in reality it comprises the chief labors of four years only of a philosopher's life. Happily John Herschel, in the respect of devoted and intelligent labor, does not stand alone among the other great astronomers of his age. The world hears but little of them at the time; they neither strive nor cry in the streets, but their labors remain as imperishable as the genius which inspires them.

As was natural and honorable to all concerned, he was greeted with enthusiasm on his return to England. There is something contagious in a great example, and one of Herschel's rewards consisted in this, that he inspired others with a zeal kindred to his own. In due time another astronomer, Mr. Lasell, at his own expense and with a more magnificent instrument, expatriated himself and his family to Malta for three years, under the hope of adding to the discoveries of Herschel. And in this he succeeded.

In 1830 appeared Herschel's well-known Preliminary Discourse on the Study of Natural Philosophy, this was followed by a similar volume on Astronomy, the latter, in 1849, was superseded by his larger and more important Outlines of Astronomy.

His two treatises on *Light* and *Sound* were published in the *Encyclopædia Metropolitana* about the year 1830. The former contains the results of his own experimental investigations on the action of certain crystals on polarized light—plagiedral, quartz, apophyllite, Rochelle salt, for instance,—results which have been confirmed and generalized since his early days.

But it is in his volume of addresses to public bodies that the great philosopher is seen in his happiest and most instructive mood, for these addresses contain the outpourings of a man walking at liberty among sympathizing associates.

In this volume his review of Quetelet on Probabilities is reprinted; it favorably exhibits Herschel in the guise of a social philosopher. The volume terminates with a collection of certain of his efforts in fugitive poetry. For John Herschel was a poet in a high sense, and of science he was emphatically *the* poet. Without imagination no man can become a truly great philosopher, and still less a truly great writer, and Herschel was both. There are passages in some of these little poems which plainly indicate that had he chosen to make poetry the occupation of his life, he must have occupied a conspicuous place among the poets of his age.

During the last few years of his life he busied himself in arranging a catalogue of all the double stars that were known to exist up to the most recent date. The catalogue was completed just before his death. It contains about 10,000 double stars, all arranged in Right Ascension and Polar Distance, and the entire history of about 5,000 of these stars is completed.

John Herschel met with an amount of public recognition unusual in England. He might have been, had he wished it, president of the Royal Society ; and he four times accepted the chair of the Royal Astronomical Society. At an early period of his life he received the recognition of a Hanoverian knighthood, and at a later period the heritable title of a baronetcy was accorded to him. Naturally he was a member of almost every important learned society in either hemisphere. The French Institute honored themselves

by at last electing him a foreign member of their body. He married Margaret Brodie, daughter of Dr. Stewart, in 1829, and left a numerous family; two of his sons are favorably known in the realm of science.

It is not for us to lift the veil which screens the sanctities of domestic life, but we may say that in his home he realized just what the reader would picture and would wish that life to be. He was a firm and most active friend. He avoided all scientific feuds; he gladly accorded a helping hand to those who consulted him in scientific difficulties; he never discouraged or disparaged men younger than, or inferior to, himself. He was pleased with the appreciation of his works, but this was not an object of his solicitude. "His was a life full of the serenity of the sage, and the docile innocence of a child." He died, as he had lived, in the unostentatious exercise of a devout, yet simple faith. What was mortal of him was laid in Westminster Abbey, close by the side of Newton.

* VENUS TRANSIT AND SUN DISTANCE.

PART I.

News-notes have now arrived from nearly, if not absolutely, all the various observing parties sent to different parts of the world last year (1882), to observe the rare phenomenon of the transit of the planet Venus across the disc of the sun, which took place in the beginning of its closing month of December.

Readers of the *Ouse!* will doubtless remember what an untoward occasion it was over the greater part of England and Scotland, where it was not only cloudy but snowing bitterly, and with all the collected forces of the whole winter; for however deep were the snow wreaths so early in the season as on that December 6, very little more followed on the subsequent days, even months; and we seem now fairly launched on a warm spring-time of the olden type.

Our countrymen in Australia were, however, grievously disappointed. Not by snow, for December 6 is near the middle of their summer, or as one of their local poets has learned to sing "when hot December's burning breath,"—but by clouds extending from Melbourne to Sidney and even to Queensland. In New Zealand, though still further south and east, the sky was clear, and good observations were obtained. The same was it also in another southern latitude, but not so far to the east, viz., in Madagascar.

Of course there, not by the natives thereof, were the requisite observations made; for their genius lies far more in the direction of fighting, and the only mills which the mechanic of the missionaries was called on to erect for them were gunpowder mills. But for Madagascar, a British expedition had been sent out from this country in a man-of-war, peacefully inclined; and its members wisely did not attempt a landing on the great belligerent island itself, but on a mere sandbank off its coast—sufficient, however, with deep foundation pits well filled with imported concrete and Roman cement so-called, for the support of the several instruments of observation. The sailors, indeed, heartily assisting at this preliminary work; and in that clear tropical climate, watching the setting of Venus after the sun had set, day after day before the crucial 6th of December, became dolorously sympathetic as to the length of way between her and the sun, and were certain "she would never be able to fetch up in time." But for all that, on the predicted day, there she was upon, and crossing over, the sun's face, within such narrow limits of

*From No. 34 of the "*Ouse!*" for June 19, 1883.

exactness too, as to require a great deal of hard calculation, and reference to other observations for time, latitude and longitude, to say whether she was some few seconds too soon or some few seconds too late, in a transit that occupied in the whole, several hours,—to accord with the prediction calculated at the Nautical Almanac Office in London years before.

Similarly in North America the weather was fine; indeed for that country at that season wonderfully mild, the thermometer ranging only from 41° to 45° Fahrenheit; and the whole of the passage of the planet across the sun was there visible. It was seen, too, in the grand equatorial telescopes, which are now so numerous in that Republican land, that they rather solemnly warn us, living too easily and confidently in our monarchical country, that Athens of old showed how a republic may after all be far more refined, intellectual, and generous of noble gifts to posterity than any king or emperor.

So it came to pass last December, in America, at the comparatively small city of Princeton, New Jersey. Its mere mushroom university as to age, showed that it had already installed an observatory, furnished it, too, with an equatorial telescope far beyond that of any public observatory in old Great Britain, viz., one of thirty-six feet in length, with an object-glass of twenty-three inches in diameter, perfect clock-work movement to follow a heavenly body in its diurnal motion, and, for the sun, a large polariscope eye-piece, where, by several reflections, each at the exact polarizing angle for decreasing the strength of a ray, the eye of the observer, which otherwise would have been "blasted with excess of light," was enabled to view the sun and the planet upon it with mildness and comfort, and especially without the intervention of that rude and dreadfully vulgar method of old, viz., dark colored glasses.

The Americans then did their duty grandly to the astronomical phenomenon of their time and country, for the above is only one example out of many. But they had a still more peculiar part to fill; and they did, and are doing, that too. The final object of all these observations and expeditions to all parts of the habitable earth is not merely to get a satisfactory observation of what was to be seen at each place, but by so comparing the extreme minutiae of one set of observations on one side of the earth with those on another, as to be able thence to deduce the distance of the sun—that great centre and radiator of the conditions of the physical life on the planets—from our earth, such sun-distance being moreover the grand base-line in nature from whence man has to measure the size of the whole solar system, and the sidereal heavens themselves.

Now this sun-distance is so enormously great, compared with the mere breadth of the earth, that its measurement therefrom is one of the most difficult and voluminous of practical problems in astronomy, though, when it is obtained, the numerical result can be written on one's thumb nail. But will that result be the correct one?

The modern world has been quite content for eighty years with the particular result it had deduced from the similar Venus transit observations of the last century; but in 1870 was obliged to confess that its numbers were much, so very much, in error, that they looked forward to getting a better result with the improved instruments of modern times, at the then pending Venus transit of 1874. That transit came off amid loud worldly applause as to the success of the raw observations; but when these came to be computed with immense labor and expense—behold the results, which were many, for sun-distance came out so variously and contradictorily that even ploughmen could perceive they could not all be correct.

So what did the learned astronomers of a too generally free-thinking class of society in all European countries do? They held a conclave last year in Paris, of all nations; issued thence concerted instructions for all astronomers to observe the Venus transit of 1882 in one particular manner; and further required them to send in their observations, when made, to that conclave's secret apartments in Paris, where the observations would all be computed by a very able party within;—and only one result from sun-distance would be

allowed to go out to the world, which poor world would be bound to accept the result without questioning.

Yet to some persons the above proclamation sounded too much like Nebuchednezzar calling all nations and peoples to a central meeting at Babylon, and requiring all of them, when they should hear the sound of his music, to fall down and worship an image of his own setting up. But as we all know there was a very confounding exception to that congregation of worldlings, viz., Daniel and his friends. And something approaching to the same happened to this modern gathering on the banks of the Seine; for N. America alone, of all the great nations, refused to join the secret conclave, and further declined to attend to its suggestions of throwing aside the faithful, impassive method of photographic registration, for too impressionable human eyes and feelings.

Accordingly, not only have the Americans stood out for the liberty of the world in this matter of sun-distance—by observing and beginning to compute it in their own way—but they have adopted the elsewhere proscribed method of photography so enthusiastically that, at the Princeton station above-mentioned, they took no less than 191 photographs on glass plates during the transit. These are now under microscopic measurement, together with the similar hundreds or even thousands coming in from their other free and independent stations in other parts of the world.

And what shall be the end of this grand intellectual contest of the nations in these latter days?

Space obliges me to defer to a Part 2, whatever little glimmering of light I may be able to throw on the matter.

PART II

At the close of Part I, on the above subject, we saw a great astronomical gathering of nations in the city of Paris, erecting themselves into a central authority over all human kind, and preparing so to compute the Venus transit observations of 1882, wherever or by whomsoever of their conjurors made, that only one result for sun-distance should become known, and then have to be necessarily accepted by all the world. But we also saw how a certain great nation, separated from the others by Nature's broad unconquerable ocean—God's highway possession, not man's—had broken off from that confederacy with intent to do whatever should be demonstrated by its own astronomers to be the right thing. And there are deeper issues in this movement than first appear.

That the seat of the would-be universal scientific "bund" just mentioned is the same city of Paris, whereto, at the end of last century, all nations were invited to another conclave for the purpose of persuading them to destroy their hereditary and historical weights and measures, derived from far-off antiquity, and to accept instead the then newly invented French metrical system—the very object of which, as explained by M. Talleyrand to the National Assembly which has proscribed the Christian religion, was to proclaim that the earth belongs to man and not to God—is a momentous and significant feature not to be forgotten. Neither should we omit to remember that the one noble nation which has just now stood out against the bad re-concentration of all people and tongues in the same city for another mensuration purpose, viz., the distance from earth to sun, is the United States of America,—own child of those English "Pilgrim Fathers," who crossed the Atlantic more than two hundred years ago, with the Holy Bible in their hands as the best of their worldly possessions. For so true are they still to those principles in which they were brought up, that while all other nations, save Great Britain and Russia, have by this time fallen down before the rule of the French metre—and some parties even in those two countries are not very firm in their faith or strong in their principles—the United States men have gone ahead and have very recently established, on the banks of the Ohio, a direct opposition to the French metre and its present unscrupulous propagandism. This opposi-

tion appears under the title of "The International Institute for preserving and perfecting national and hereditary Weights and Measures," wherever they can be shown to have been derived, as the members believe the Anglo-Saxon can, from the primitive wisdom of divine revelation—this wisdom being learned by them either from the Bible directly, as a book, or the Great Pyramid as a monumental appendix thereto; said Pyramid, though in, yet being not of or belonging to Egypt and its Cainite inhabitants, for it was really designed and erected, as recorded in Josephus, by certain of the descendants of Seth, under encouragement and assistance from the living God.

But a theme such as ours has now become, involving new references across all the gulfs of time, from our own days up to the beginnings of national life, before any extant written history, is perhaps more than the boy-editor of the little *Ousey* bargained for, when asking the contribution of merely a "paper;" or than the young readers thereof are likely to much care for, or be able to attend to in the short intervals they have at their disposal between their stricter school studies and the athletic sports so necessary both to their present muscular development and the continued mental energy of their after life. But precisely because they are so young now, they may be destined in the coming future, and even before they are fully grown to man's estate, to witness a resumption on this earth of the course of visible Theocratic rule and direct divine instruction, of which invaluable kind of teaching in times past the true sun-distance was but a very simple item, yet most precious in its simplicity for the light it throws on a growing topic of our perplexed times, viz., the respective capacities for arriving at and setting forth cosmic truth, of modern science and ancient revelation.

Of course this being the epoch of said modern science, it has its advocates in crowds. It is, too, undoubtedly so much further advanced now than it was 50, and then than it was 100, years ago,—that for astronomy, viz., all accurate astronomy in angular mensurations and mathematical computations, its rise is considered to have taken place only with Bradley, the English Astronomer Royal, in the beginning of the last century. Wherefore if, "on progressive development principles," we should go back not 200 only, but 2000 years, no one whatever would expect that any observers then existed having astronomical instruments, theories, or methods capable of more than what men would now call childish, elementary work.

Still worse would have been the case for that side 3,000 years ago, a time entitled by some writers "Juventus Mundi;" but still even 3,000 years ago is not easily enough for primeval-revelation enquiry purposes, for ethnical inspiration had then everywhere ceased, and what of it had come down, chiefly in tradition, to that day from far earlier times—pure in spirit and matchless in truth, because of divine origin—was intercepted by the ancient Greeks, with their astonishing cleverness, but little regard to honesty, and perverted into glorifications of their own heroes, and the gods they themselves invented.

But the sun-distance of still earlier ages, and of times still more favored by divine inspiration, such as 4,000 and 5,000 years ago, rests on more certain and tangible authority, viz., the Sethite Great Pyramid, already mentioned. And it is something both still, and exactly, measurable, for the grand cosmic metre-yard is found to be symbolized in the chief dimension of that whole building, and practically given as indicating a length equal to 91,840,000 British miles.

When this was first announced by Mr. William Petrie, C. E., and others, some fifteen years ago, while all European science, with its text books for schools included, was still living under the belief that the distance from earth to sun was something over ninety-five millions of miles, it was of course disbelieved. And even when a quarter of a million of public money was spent in the year 1874, in sending out numerous expeditions to all parts of the earth to get a new sun-distance measure by observations of the Venus transit of that year, the reported record of the same thing from primeval divine inspiration was very carefully hid, by those popular parties and their friends in office, under a bushel.

Yet there it has refused to remain. For ever since that date, and up to the occurrence of the next Venus transit, viz., that of last December, the leading astronomers of the nations have been finding that both their Venus observations of 1874, and any others for the same sun-distance purpose they have been enabled to carry out on either the planet Mars, or any of the planetoids between Mars and Jupiter, have simply produced among themselves a divided house, nearly one half of the said astronomers so computing their observations as to bring out the sun-distance as something over ninety-three millions of miles, and the others equally certain that the correct result is ninety millions and some hundred thousands.

Wherefore see how calmly the Great Pyramid's sun-distance of old may continue to look down from its forty centuries on the strugglings of modern science, even in its present high development. For the more its votaries fight with each other, the more they prove their inability to come nearer to the correct result in such a problem than some two or three millions of miles. And the more, too, they show that the mean of all their varying results establishes the error of the sun-distance quantity they had been using in the name of modern science up to fifteen years ago, at the same time that it indicates the superhuman truth of the one Great Pyramid primeval numerical quantity, or an expression in number and measure framed up there in that giant building "in the beginning of worlds," and coming from a source of knowledge which had no uncertainty, no successive approximations, but gave out the truth at once perfect and instant, an attribute of the divine alone. And if divine, what other result in principle is likely to be found, on computing the observations made at the late Venus transit of 1882 than that which has already so remarkably resulted from the similar observations of 1874?

C. PIAZZI SMYTH.

TRANSACTIONS OF THE OHIO AUXILIARY SOCIETY OF THE INTERNATIONAL INSTITUTE.

NOVEMBER, 7, 1883.

The President being at the annual meeting of the International Institute in Boston, Mr. A. M. Searles acted as presiding officer at the meeting of the Anti-Metric Society.

The following persons were elected members:

John G. Goodwin,	London, England.
G. M. Rusling,	New Jersey.
C. E. Hackettstown,	New Jersey,
Adjutant W. K. McAllister,	Garden City, Long Island.
J. P. Weether,	Millfield, Ohio.

An encouraging letter was read from Jacob M. Clark after which the society listened to the pamphlet written by Professor J. N. Vail, of Barnville, Ohio, in support of the theory that previous to the flood rings or belts of water surrounded the earth, making an aqueous firmament, and it was this water which fell in the destructive rain of "forty days and forty nights." This belief has been promulgated by other men, notably by John Taylor. Its presentation elicited a spirited discussion which consumed the evening up to the time of adjournment.

The annual meeting of the Ohio Auxiliary Society was held at noon on the 8th, and adjourned to the 21st.

November 21.

At the annual meeting of the above Society held yesterday, the following were elected officers for the ensuing year :

President—Charles Latimer.

Vice President—A. M. Searles.

Treasurer—William H. McCurdy.

Corresponding Secretary—G. W. Crossette.

Recording Secretary—Mary B. Sanford.

Trustees—J. H. Devereux, J. F. Holloway, J. A. Bidwell.

The members elected were:

George M. Atwater,	Springfield, Massachusetts.
Ole Olsen,	Elgin, Illinois.
S. C. Ellis,	Boston, Massachusetts.
Professor E. R. Graham,	Fairville, Missouri.
J. Nehab, Ph. D. St. Paul's School,	Garden City.
James H. Moore,	New York, New York.
Captain R. Kelso Carter,	Chester, Pennsylvania.
Dr. Porter W. Taylor,	Cleveland, Ohio.

The treasurer's report showed the total receipts for the year to have been \$2,384.66 and the disbursements \$2,341.90, leaving a balance of \$42.76. One hundred and eighty members were added to the list during the past year, which makes the total membership about five hundred and fifty and shows a decided improvement over last year. After discussing plans for work for the coming year the meeting adjourned until 7:30 p. m., when the President gave an interesting account of the annual convention held in Boston on the 8th inst., speaking especially of Mr. Wood's paper on the cycloid, making Petrie's recent measurements at the Pyramid conform with those of Professor Smyth, and of the new system of standard time which has recently been adopted by the railroads of the country and, he thinks, will soon be used by the people at large.

The originator of the system is Mr. Sandford Fleming, C. E., of Ottawa, Canada, a prominent member of the International Committee on Standard Time and Prime Meridian. We are, however, indebted to Mr. W. F. Allen, of New York, for bringing the subject before the railroad world and arranging the system for the various roads. Seventy-eight thousand miles of railroad are now being operated according to this system.

The President also spoke encouragingly of the work in New York and New Jersey, and stated that an auxiliary society had been organized there with Mr. Roland, C. E., as President and Clark Fisher, C. E., of Trenton, as Vice President.

Mr. W. T. Alan of Greenville, Pennsylvania, then read an interesting paper entitled "The Analogy between the Salt of the Sacrifice in the Bible and the Pyramids." Referring to Christ's words to the Apostles: "Ye are the salt of the earth," he called attention to the fact that salt crystals are in the form of pyramids. He made a number of similar and striking analogies which space will not admit of mentioning.

Rev. Charles Edward Locke, of Garrettsville, then gave a very interesting account of his recent visit to Europe and the pyramids, and made the following remarks in reference to the interior finish of the King's Chamber, in regard to which there has recently been some discussion among Cleveland gentlemen. * * * * "We were particularly interested in examining the King's Chamber. In a conversation I had with Mr. Latimer previous to our departure for Egypt, he said there had been quite a spirited discussion among some Cleveland gentlemen concerning whether or not the inner surface of the King's Chamber was polished. At his request we gave this point special attention and found the walls very highly polished. Any one who would take the trouble to rub away the dust which thickly covers the walls could make no mistake in the matter. The polish is as fine and beautiful as that of the most elegant monument in Westminster Abbey."

After the conclusion of his remarks Mr. Tully favored the audience with a fine collection of stereopticon views of Egypt and the pyramids, which were explained by the President in a highly entertaining manner.

DECEMBER 5, 1883.

After disposing of the usual business at the meeting of the Society the following persons were elected members:

LIFE MEMBER.	
Mrs. Moses Hiil,	Kalamazoo, Michigan.
INSTITUTE MEMBERS.	
R. W. Crompton,	Barrie, Ontario.
W. C. J. King,	Barrie, Ontario.
Mrs. Gustav Lindenthal,	Sewickly, Pennsylvania.
William Rundquist,	Elgin, Illinois.
Spencer H. Smith,	New York.
Thomas B. Lee,	New York.
Edwin Wilmshurst,	Retford, England.

Two important papers were presented and listened to with great interest. The first, Mr. N. B. Wood's report on weights and measures, was very exhaustive, and showed deep study into the subject. He thinks it would not be well to apply old names to new quantities, which would increase the confusion already existing. We already have three kinds of pounds, five or more ounces, and an unlimited number of pints, quarts, gallons and bushels, and to add others would make the confusion still greater. Mr. Wood thinks our system should be cosmopolitan in its nature and not designed for the exclusive use of any special class. We should not, however, forget the advantages of a decimal system because a large class of people cannot understand decimals, because this is preeminently a country in which the masses are to be educated. We must have a decimal system based upon our British inch and pounds avoirdupois, or we will be compelled to adopt the metric system.

Mr. Taylor in his report says that a decimal system applied to weights and measures must result in failure, and that experience has shown that the primary and most needful division of all most common units of measures is into halves and quarters. Admitting the correctness of this statement, however, we experience no difficulty in dividing our money into halves and quarters, and the inch can be similarly treated when used decimals.

Mr. Wood suggests the following table of units to be expanded as far as necessary to meet all reasonable demands:

Angles,	Unit, Degrees,	Duodecimal.
Time,	Unit, Hours,	
Space,	Unit, Inch,	Decimal.
Space,	Square Unit, Inch,	
Space,	Cubic Unit, Inch,	Decimal,
Weight,	Unit, Pound,	
Money,	Unit, Dollar,	Decimal,

After the paper had been discussed at some length, Rev. H. G. Wood, of Sharon, Pennsylvania, read his article No. 3 on "The British Mile," which relates specially to the corner sockets of the Great Pyramid and its base sides which are of variable length and do not form a true square, as found by the measurements recently made by Mr. William Flinders Petrie, of England, which do not conform to Professor Smyth's theoretical base. The cause of this discrepancy is that the four corner sockets are on different levels. The axial line of the Pyramid produced to the proper level makes the length of the base conform with the theoretical base given by Professor Smyth, so that Petrie's measure-

ments, instead of confuting those given by the professor and overthrowing his Pyramid theory, serve to establish it more firmly.

Mr. Wood showed that the amount of departure of each side from a true square has some special and important significance, which makes the Pyramid stand out more prominently as a symbol of unknown knowledge and containing in its stone walls more wisdom than had been dreamed of. Space will not permit of going into the details of Mr. Wood's paper, which was replete with new and valuable data.

DECEMBER, 19, 1883.

A number of interesting papers and letters were presented at the meeting. Professor W. A. Rogers, Astronomer of Harvard College, wrote that he will have completed for the society in a few weeks the standard steel yard, on which he has divided an inch into 10,000 parts, and which he thinks will be superior in accuracy, etc., to any he has yet made.

Mr. R. Ballard, a civil engineer in Queensland, Australia, sent a communication congratulating the Society on its work and presenting his theory that the shape of the Pyramid is taken from a pentagon, or five-pointed star. In his recent work on the Pyramid this theory is promulgated.

A valuable letter from Professor Piazzi Smyth came in answer to the resolutions passed at the annual meeting of the society supporting his measurements as correct. A number of other interesting letters were read from members in this country and abroad. A vote of thanks was passed to Mrs. E. Bedell Benjamin for her gift to the Society of an antique pair of scales.

The following persons were elected members :

Victor Ernst,	Jersey City.
H. B. Beal,	Marion,
Joseph Hugill,	Akron.
E. E. Whitney,	Cleveland.

MINUTES OF THE FOURTH ANNUAL CONVENTION OF THE INTERNATIONAL INSTITUTE.

BOSTON, MASS., November 8, 1883,

The following are the minutes of the fourth annual convention of the International Institute, held at noon at Tremont Temple (Room 29):

The meeting was called to order by Charles Latimer, President, and a brief prayer offered by Rev. Jesse H. Jones.

President Latimer then read his annual address elsewhere published.

The treasurer's report was read.

On motion of Lieutenant Totten, it was voted that the annual election of officers be postponed till other matters in hand be disposed of.

Rev. H. G. Wood, Chairman of the Committee on Standard Time and Prime Meridian, read his report.

M. l'Abbe Moigno's paper on the same subject was read by the chairman, Mr. Wood, likewise that of Professor Stockwell, of Cleveland, O., and also that of Sandford Fleming, of Ottawa, Canada.

Jacob M. Clark, C. E., of New York City, then read a paper upon Standard Time.

A paper from Commander W. B. Whiting, U. S. N., of Milwaukee, Wis., was read by Rev. Mr. Wood on the same subject.

Mr. Latimer then read an extract from a paper by Sandford Fleming, C. E., of Ottawa, Canada, on the same subject.

Rev. H. G. Wood read an original paper on the cycloid, in its relation to the Great Pyramid and the earth, proving that the measures made by W. F. Petrie proved the accuracy of those of Professor C. Piazzi Smyth, Astronomer Royal for Scotland.

It was voted that a committee of three on nominating officers for the ensuing year be appointed by the chair.

The chair named Hardy, Wood and Totten as the members of the committee, and afterwards Mr. S. W. Libby was added by the votes of the members present.

It was voted that a Committee of three on Charter and Constitution be appointed, consisting of Charles Latimer, J. H. Dow and Jesse H. Jones.

Adjourned to meet at 7:30 in the evening in the Chapel Hall, for the exhibition of stereopticon views of the Great Pyramid, etc., and also to meet for strictly business purposes at Tremont Temple (No. 29) the following morning, at 9 o'clock.

A paper was read by J. H. Dow, of Cleveland, published in this number of the Magazine.

A paper was read and illustrated by Jacob M. Clark, upon the theory of Ballard, C. E., of Australia, which appears in this number of the Magazine.

Mr. J. H. Dow moved that a vote of confidence be extended to Professor Piazzi Smyth, in view of the late remeasurements of Mr. Petrie, which seem to militate against those made by him in 1865; and that the Rev. H. G. Wood, whose able paper upon the cycloid in its relation to the earth, using Mr. Petrie's own measures that so many were regarding as conflicting with the theories of Professor Smyth, actually *confirms* these theories and Professor Smyth's measurements in a most remarkable and satisfactory manner, be requested to inform Professor Smyth of the Society's action.

ROOM 29, TREMONT TEMPLE, Nov. 9, 1883.

In pursuance of adjournment, the meeting was called to order by the President Charles Latimer, and opened with an earnest prayer. The committee on nominations reported through its chairman, Lieutenant C. A. L. Totten, as follows: "Your committee reports the following nominations for officers of The International Institute for preserving and perfecting weights and measures for the ensuing year: President—Charles Latimer, C. E.; Vice-President—Jacob M. Clark, C. E.; Treasurer—G. R. Hardy, C. E.; Secretary—Lucian I. Bisbee. Trustees—Gen. C. B. Norton, Charles Latimer, C. E., Rev. H. G. Wood, Mr. J. S. F. Huddleston and Rev. James French.

It was voted that the report be laid upon the table.

The committee on charter then reported: "We do not find that there is any constitution other than the one adopted Nov. 8, 1879. That no charter has been taken out; that all action taken to change the constitution, in 1882, was premature and does not affect the present organization until the charter is taken out and adopted.

Signed, { CHARLES LATIMER,
J. H. DOW,
JESSE H. JONES.

The report was adopted and the committee discharged.

It was then voted and passed that Mrs. Piazzi Smyth be elected an honorary member of the International Institute, and that the Rev. H. G. Wood convey the compliment to her in the letter transmitting the foregoing resolution.

The committee appointed to confer with the Commissioner of Deeds and Titles, relative to matters concerning incorporation, made their report: "That it was deemed expedient that a charter be obtained under the Educational Statute, chapter 115, Public Statutes of Massachusetts."

It was voted that the report of the committee be accepted, and that the proper officers of the Institute promptly carry the necessary measures into effect.

The report of the committee on nominations was then taken up, and the following officers were duly elected for the ensuing year:

President—Charles Latimer, C. E.
Vice-President—J. S. F. Huddleston.
Treasurer—G. R. Hardy.
Secretary—Lucian I. Bisbee.

Trustees—Gen. C. B. Norton, Boston; Rev. H. G. Wood, Sharon, Pa.; Rev. James French, Philadelphia, Pa.; Clark Fisher, C. E., Trenton, New York; Charles H. Drew, Boston.

A long discussion ensued touching upon matter connected with the constitution and the charter. At its close a committee consisting of Charles Latimer, J. F. S. Huddleston and Rev. H. G. Wood were appointed to consult with the Commissioners of Deeds and Titles at the State House, relative to the requirements of limitation relating to bodies intending to become incorporated and to find out the necessary steps to be taken in our case. The Institute then took a recess until 2 P. M.

The Institute met pursuant to adjournment.

It was voted that C. A. L. Totten be appointed temporary secretary.

The following resolutions were then offered, seconded and carried:

Resolved, That the organ of the Institute is THE INTERNATIONAL STANDARD.

Resolved, The funds of the Institute shall be devoted to maintenance of the STANDARD.

Resolved, That no salaries shall be paid any officers of the Institute from any fund in hand not otherwise appropriated and authorized by the proper officer.

It was voted that the chair appoint a special Committee on Constitution, to include the President. The President, in accordance with the vote, then appointed the following committee: Mr. Jacob M. Clark C. E.; Lieutenant C. A. L. Totten, U. S. A.; Rev. H. G. Wood, Lucian I. Bisbee, C. E., and Doctor David Lawrence.

Resolved, That the International Institute extend a vote of thanks to the press.

Resolved, That the International Institute hereby extend a vote of hearty thanks to Rev. Dr. Burdock for his courtesy in offering his committee rooms to said Institute wherein to hold its annual meeting.

There being no further business before the Institute, it adjourned at 7 P. M., to meet at the call of the President. (Signed), C. A. L. TOTTEN, U. S. A. SEC'Y. *pro tem.*

LETTERS.

LETTER FROM MR. BESWICK TO MR. LATIMER REPLYING TO THE CRITICISMS OF MR. ABBOTT.

STRATHROY, ONT., November 10, 1883.

CHARLES LATIMER, ESQ., C. E.:—

The INTERNATIONAL came to hand safe this morning. I find the following criticism on my article, "Symbolism of the Passages in the Great Pyramid." The writer says:

"I fear some of your men are beyond their depth, for in the last INTERNATIONAL I perceive that one finds room for nine signs of the Zodiac in the interior of the Great Pyramid.
* * * But Beswick is wild. His assertions have nothing behind them. Each sign has always been 1-12 of a circle, or 30 degrees. ASAHEL ABBOTT."

* * * He begins with saying: "I fear that some of your men are beyond their depth." That certainly is cause for fear, with wise men especially. But why fear?

—what has caused it? He tells us, "for I perceive that one finds room for nine *signs* of the Zodiac in the interior of the Pyramid." Here the professor is mistaken; the writer says, "Nine *constellations* have thus been accounted for;"—page 224. *Constellations* are groups of stars, and *signs* of the Zodiac are not groups of stars at all, in any sense, but divisions of the Zodiac into twelve sections; each section is 30 degrees in length. But not a single star belongs to the *signs* of the Zodiac—not a star. Remember that, professor. For the *signs* move backward with the precession of the equinox, and the stars would go back with them, *which they do not*. The professor will remember that also.

But he continues: "Beswick is wild. His assertions have nothing behind them. Each *sign* has always been 1-12 of a circle, or 30 degrees." But Beswick is talking about constellations, not about signs. *Constellations* are not *signs*. He says that the constellations, like the passages, are not of equal length; the signs of the Zodiac are, but not the constellations. And Beswick is talking about the constellations only. Professor Asahel Abbott contradicts him, says he is talking wildly, that the "*signs* have always been 1-12 of a circle, or 30 degrees."

* * * Aries is 30 degrees as a sign, and 21 degrees as a constellation. Taurus 30 degrees as a sign, and 36 degrees as a constellation. Pisces 36 degrees as a sign, and about 46 degrees as a constellation. Seven constellations are less than 30 degrees in length, and five are more than 30 degrees.

Had the professor been a practical astronomer, he would have known that the first point in Aries as a *sign* is reckoned from the equinox, and is always next to the equinox, and follows the equinox backward in its precession all around the circle of the Zodiac. The *sign* Aries moves with the equinox, and at the same rate and time. Thus Aries as a *sign* has left Aries as a *constellation*, and is now far advanced into the constellation Pisces. All the signs have left the constellations of the same name behind them, for the constellations never change, and the signs are always changing. Hence the Pyramid passages represent the fixed and permanent divisions of the heavens, on which the stars are placed, for the stars do not belong to the *signs* of the Zodiac. Herschel's *Astronomy*, page 381, says: "The *constellation* Aries actually occupies the *sign* Taurus, the constellation Taurus occupies the *sign* Gemini, and so on." And in time, the *sign* Aries will be on the opposite side of the Zodiac to that of the constellation Aries, and every other sign at some time or other will be opposite the constellation of the same name.

I sent questions to twenty-four of the principal observatories in Canada and the United States, including the Naval Observatory at Washington, and received from the professors very nearly the same answers as to the lengths of the constellations. For instance, Professor McLeod gave Aries 20 degrees and 45 minutes as its length on the ecliptic, between the points of its crossing, and Taurus 35 degrees and 45 minutes. Professor Curley, of Georgetown Observatory, gave Aries 21 degrees, and Taurus 36 degrees. The Great Pyramid measures given by me in the essay are Aries 20 and 36 minutes, and Taurus 35 degrees and 50.8 minutes. Will Professor Asahel Abbott say that these professors and experts are "wild," and are "making assertions with nothing behind them," because they give the same figures as I give in the essay? Will he still insist that the signs and constellations are the same, and are all equally divided in 1-12 of a circle, = 30 degrees?

S. BESWICK.

LETTER FROM W. T. ALAN.

C. LATIMER, ESQ.:

Dear Sir:—Rev. J. F. Fahs seems interested in the "granite leaf." If you will notice closely each person has a particular part assigned to him to work out; to you is given the mathematical part, another seems to take up some particular part of the building like Rev. Fahs and to pay special attention to that in particular. My work seems to be anal-

ogy, while I am almost deficient in mathematics. Here I think is where the great mistake lies. Suppose, for instance, I announce; there is an analogy between the niche and the beast with ten horns, you have only to communicate this to some one who is a member, who understands the history of the world; let that person ascertain if this is right (Mr. Bisbee said it was), then you take up the mathematical part, find out if the measurements of the niche do not correspond with the number of the beast, for instance (666). If this is found true announce it, giving each credit for the discovery, and not until this is settled as a fact by analogy, history and measurements, and when it is once announced and established as such it needs nothing more. In this way, step by step, each and every passage, "nook and corner," can be established on a basis as firm as the Pyramid itself.

If you were out surveying and had one man carrying the chain, another stakes and another the pole, and the man with the chain took your instrument, the man with the pole began driving stakes, etc., etc., I think there would be little headway made and a very poor job done. Now I think that is a good deal the way this Pyramid work is being done. When the Lord deals out talents it is to "every man according to his ability." —Math. xxv-15. To some he gives "prophets, to others teachers," etc., and if each one don't do his own work, and all pull together, we will not be able to make much headway. Yourself and a few others understand higher mathematics, but out of the 550 subscribers I don't believe 50 know anything about half that is published on the subject. What the others want, then, is something they can feed on too. How much better, then, to take up a subject as a passage or one apartment, then give out each to the person qualified to investigate that particular branch, then put all these results together, and if there is sufficient to establish the result as a fact, then record it and consider it final; but this skipping around, each trying to understand another's work and doubting it if he does not, is only a drawback.

I have announced that the stones or courses are symbols of prophets, apostles, etc. Now if some one would be given the genealogy and chronology of the Bible who understands it, and another would be given the measurements of those stones or courses to find out about what dates each one represents, I believe we could trace every apostle and prophet out to exactness, but having done the part which I am capable of doing, my work would cease. I am as helpless in the part which requires the work of a mathematician or the historical part as a little child, and you will find plenty in the Society who would ridicule my part of the work or any other part than their own. It is natural for men to reason with their own powers and imagine they are critics when they are only deficient.

Prof. Proctor is almost "absolutely deficient" in "faith;" he wants to grasp everything in a tangible way; he must "thrust in his hand" before he can comprehend; he cannot realize what faith is any more than a man who cannot whistle Yankee Doodle can comprehend the productions of Mozart or Wagner. In trying to show his wisdom he shows his weakness, and proves conclusively that the top of his head is very flat, therefore, so far as his opinion goes concerning the Pyramid it should be ignored entirely. Mr. Proctor would not allow a person who knew nothing of his work as an astronomer to criticise him; he would, in fact, take no notice of him, though he was ever so learned in scripture, history or any other science than that, therefore, when he criticises those of us who perfectly understand what we are doing, and who through faith and by God's direction are guided in every step, no notice should be taken of him or his harangue. Bob Ingersoll's Infidel Phrenologist said of him: "Spirituality is quite deficient which allows the intellect to pass judgment upon everything of an extraordinary nature without any prejudice in its favor." In other words, in whatever a man is deficient he is more capable of passing judgment on. That's about the way those infidels judge, from their deficiency, and that's the way Prof. Proctor does when he undertakes to criticise any one who has faith in the "altar in the midst of the land of Egypt," or anything of a spiritual nature. I think if you would glean out that part of my paper concerning the crystal of salt and publish it in the

Magazine it would interest many, adding that *pyr* means heat and *mit* or *mid* means 10, and that 10 is the prominent number in the Pyramid, it is evidence that weighs heavily with those who could not comprehend the mathematical side of the question. You told me my article had too much theology in it. I don't think we can take the Pyramid question and show it is inspired without bringing in scripture to prove it. When I announced a fact in my paper I nailed it with scripture, and that is the best of proof that anything is a fact, because it agrees with the word of God.

Well, I have written longer than you care to read. I forgot myself. Come and see me. I know you understand my work, or at least are able to comprehend it better than any person I have ever explained it to—therefore I hope to meet you oftener.

Yours very truly, W. T. ALAN.

LETTER FROM MR. SANDFORD FLEMING.

OTTAWA, ONT. November 16, 1883.

My Dear Sir :—I have been away from home since yesterday, or I would have written you sooner.

You are perfectly correct in the Standard Time matter. The printed pamphlet which I sent you some time ago, establishes beyond any question that I have moved in the matter ever since 1876. A good many of the pamphlets published that year were circulated in the United States the year following. I quite admit the valuable services rendered by others of late, although I do not know any man who has spent more time or money over it than I have.

I thank you very cordially for your kind notice in the INTERNATIONAL STANDARD. It is, indeed, a gratification to feel the consciousness of having done, or assisted in doing, something which will benefit mankind for all time. The step made is an important one, but it is only a step. There are others to be made; the next is to do away with a.m. and p.m., and I feel confident it will be accomplished. In a few years the change will be accepted by all, and people will wonder that they tolerated the old system so long.

Yours faithfully,

SANDFORD FLEMING.

LETTER FROM MR. L. BIDEN.

28 LION TERRACE, PORTSEA, November 12, 1883.

Dear Sir :—With Mr. W. H. Searles, it is my firm conviction that the granite leaf, in the Great Pyramid, is a most important feature therein. It seems almost obtrusively placed, purposely calling attention to a special fact, and if not containing details of construction, which is far more than simply probable, it appears certain that it is the depository of long, uselessly sought secrets, and may be regarded as the inner lock, whose key and that to the whole structure is within; besides which it is incredible that all the apartments and passages have been traversed, the kernel is still unfound, though it will be at the appointed time, previously to which the endeavors of the moderns have been expended on inferior investigations, all useful but not final. The standard measures will be discovered.

Yours faithfully,

L. BIDEN.

LETTER FROM R. BALLARD.

ROCKHAMPTON, QUEENSLAND, AUSTRALIA, October 4, 1883.

Dear Sir :—I am gratified to find that you appreciate my small effort in Pyramid literature. The day will come when the world will acknowledge the correctness of my deductions.

1st.—That the pyramids were great surveying instruments, and that from a distance, the surveyor could fix exact location at any time by observing their individual shape and relative positions.

2d.—That the system of trigonometry, used in their geodetic work, was right-angled and of triangles having even sides.

3d.—That the Royal Babylonian cubit of 1.685 British feet was the measure employed, and an admirable one being an even measure of the earth's circumference.

The remarks which you make upon the subject of the Lotus flower are keenly appreciated by me as a Mason. Its high significance as an emblem of very deep geometric and scientific truths is not yet *fully* understood by, I am bold to say, *any* moderns. It is the representation of "lost secrets," *i. e.*, lost knowledge.

I am so disappointed not to be able to form any notion of the objects and aims of your Society until you send me another copy of your Magazine. Would it not be well to mail me the work regularly until countermanded (which is improbable). I have no doubt I shall be so satisfied that I shall, on hearing from you again, request you to enroll me among your members.

I am, in my short intervals of leisure, continuing my investigations into the geometric peculiarities of regular stars, such as the pentangle, heptangle, etc., etc.

I trust that you will have time to go carefully through my little book. I should much like to hear your opinion on my *results*.

I know by the geometric exactitude of my work that I have found truth.

Yours very truly, R. BALLARD.

LETTER FROM J. R. SKINNER.

Dear Sir :—In regard to new measures it seems better to still attach credit to (1) the actual measure of the French between the *sockets of the north base side*, in 1799, of 9163 inches, as to which Somord says: "They took the measure of the north base side between sockets, and in the line which joins them, with a minute attention and most exact methods of proving its length." (2) Those of Howard Vyse, of whom, as to measures, where he could verify them, Piazzi Smyth says: "The incomparable Howard Vyse," and (3) those of the Sotton; and I think time will justify this.

I think the Magazine admirable, and would suggest an appeal to its now large number of readers, to obtain a fixed sum of money to carry it on; besides the amount from subscriptions I would like to be one of say two hundred at \$10 per annum. This would give \$2,000 a year independent of the subscription list. I only suggest this to get the matter into some method. I shall try to get a few subscribers, though my habits have become so isolated that I cannot expect to have much influence. I think you are to be much praised in making a magazine so choice and of such real value. It certainly shows great judgment and ability.

A few things ought to have a pin put in them for reference. (1)—Mr. Dow has, I am almost sure, struck on the real truth, viz: that the cosmic measures of the Pyramid are secondary developments, growing out of primary measures. (2)—Mr. J. M. Clark is almost assuredly right, but really but reiterates Piazzi Smyth as to this, viz: that the measures of the Pyramid almost everywhere represent ratios of difference.

The article from Mr. Petrie, as to the cutting tools of the ancient Egyptians is one of the most valuable in an exact and antiquarian point of view that I know of in archæology.

That article is worth the price of a year's subscription to the Magazine. I think the Magazine is admirable. As to my own work I am just engrossing my Part III, which is a key to the formation of an ancient language, and a consecutive and connected reading of that language in bar, under cover of the sacred text of the scripture. Part I is the finished work on the Pyramid; Part II is the Mound Builder investigation, teaching on the Palenque Cross, and other monumental slabs of North America, and Part III is the conclusion. It is, I think, demonstrative, and is so pronounced by great Hebrew authority.

J. RALSTON SKINNER.

LETTER FROM REV. JESSE H. JONES.

NORTH ABINGTON, MASS., December 7, 1883.

Dear Sir :—In accordance with your request, I will now give some account of what has been done at the Foreign Exhibition in Boston to spread a knowledge of the Great Pyramid, and the work of our Institute.

Last summer, when it became known that this Foreign Exhibition was to be held, Mr. Bisbee, our secretary, conceived the idea of getting a place for Great Pyramid work in it. Upon applying for space, he was met with the objection that this was a foreign exhibition, and the Institute was American. To this he replied that what they wished to exhibit was a model of the Great Pyramid, which was in Egypt, a very foreign country, and was the most notable object there. Upon this presentation of the case leave to place the model, and adequate space were granted.

In due time the model was in place. It consisted of a simple tent with wooden frame and cloth sides, about six feet square, and raised about six feet from the floor on another frame, within which to stand and explain. A rude model of the passages and rooms, made to scale by Mr. Bisbee, hangs at the proper place within the tent, so that the bystander can get by a moment's look quite a clear idea of the structure of the building.

In getting the model into shape, very important help was rendered by Dr. Lawrence, a physician of Boston, who has become much interested in Great Pyramid matters. He also made a model of the ante-chamber in dark and light wood, which is exceedingly useful in showing some of the curious facts of that room as illustrations of the strange problems in the whole building.

When the exhibition opened Mr. Bisbee began to attend, and explain to visitors the strange story of that greatest of the seven wonders of the world. The stream of people would pause for a little, a crowd would gather and listen, and pass on. Before long he began to give out a tract of a single octavo sheet, with an outline of the Pyramid at the top of one side and containing a statement of some of the most striking proportions and problems in it. Of these, some six or seven thousand have been put into the hands of visitors.

One evening in the early part of October, as Mr. Bisbee was trying to get on to the horse-car to come away from the exhibition, the conductor rang the bell before he was on and he was dragged several rods. To a man seventy-six years old the strain was so great that he was confined to the house for a month. During this period the writer was enabled to attend the exhibition a few days at different times, and address the passers by. From this experience he may be permitted to say that the opportunity was most excellent and the partial loss of it a great misfortune. The little crowds would all be interested, and some would return again or send others ; and so the seed was being sown widely. Could a man have been kept there constantly, in no way could the Pyramid work have been so economically and efficiently carried on. It was noticed that in not a single instance was the tract which was given thrown on the floor, but often many and interesting questions were asked. This fact, which shows the interest awakened, was observed by all who had part in the matter. Dr. Lawrence gave considerable time ; and Mrs. Libby, Mr. Bisbee's

assistant, attended as many days as she could, distributing the tracts, selling pamphlets and soliciting memberships. Thus with the admirable models, in spite of great difficulties, a very considerable work in spreading the knowledge of the Great Pyramid has been accomplished, and at a trifling expense. At a moderate cost many times more might have been done. Cordially yours,

JESSE H. JONES.

LETTER FROM THOMAS HOLLAND ESQ., OF WANDSWORTH ROAD,
CLAPHAM, LONDON., S. W.

ENGLAND, OCTOBER 3, 1883.

Dear Sir.—To further elucidate my ideas of construction, I would suggest as another discovery, that the granite floor 103.1 inches, has to be lifted as the first operation, that to be accomplished by aid of the granite leaf and the side holes through this floor, and following down the grooves in wainscoting.

To my mind the floor constructed of granite is obviously to resist sudden concussion or stress put on it while doing duty as a covering to a sunken cavity, or why need the floor at this particular part be of granite and the side holes left open? This floor slab removed could facilitate the removal of 36 inch step top of sloping floor of grand gallery, which is evidently an obstruction purposely placed to elicit enquiry, thus far it having determined the yard standard of 36 inches, also brought up the floor line to its 50th course of masonry, also the basal plain, the perimeter of whose four sides equals the diagonals of lower base, and repeating the intention the Great Master Builder had to substantiate the precession of the equinoxes. Besides this there are other intentions of magnitude, so much being practically constructed to show its purposes when removed without doing violence to any of its adjoining parts. I therefore think the step stone has to be removed as well as the floor of the ante-room, and when the wainscoting is removed a grand scheme of constructive skill and wisdom will be apparent.

The plug holes in the lamps, with their uses, will be evident; I have a strong opinion about their utility. I have every reason to believe the original construction at the foot of the grand gallery was equally as elucidative, showing clearly the intent of the Grand Master. When, therefore, the sloping floor was removed with other obstructions there was the opening or passage leading to Queen's Chamber, which chamber draws me on to another constructive part, the niche in east wall. The table stone, shelf, or what else it may be called, is a plug stone, fitted in to hide or protect a long entrance passage to another chamber beyond, which is equally as plain and positive as the ante-room, and I think it possible to point out the time when this removal foot of grand gallery and the plug stone to niche was shifted. Piazzi Smyth offers a very close approximate to the time, and with this I have exhausted all my time I have to spare on this occasion and must draw this epistle to a close.

I was about closing this for post when I received a magazine from Mr. Unwin, the editor of Israel's Prophetic Messenger. This magazine is the March number of International Standard, a thoroughly valuable work. Is it to be procured in this country? I inquired at Guests in Paternoster row—they knew nothing of such a work. I should very much like to make one of the expedition Mr. Latimer has in contemplation to the Pyramid to unravel in a practical sense its construction. There is yet much to be explored. I do not think we are in possession of one half its mysteries and what is intended to be our guidance in these "latter days." It is truly marvelous the means used by the Almighty to open the eyes of His people, and to accomplish works of magnitude by human agencies of giant proportions without any strain on the general routine of nations and the usual programme whereby we move and have our being.

I sincerely hope and trust the publication and important cause it advocates may prosper exceedingly. We are not without those in this country who would strive for the debased

metric system. I believe the time not far distant when the Anglo-Saxon element will prevail the world—I may say the wide world over. Yours respectfully,
THOMAS HOLLAND.

MR. LATIMER TO MR. GLADSTONE.

Mr. Latimer, in his letter to the English premier, after thanking Mr. Gladstone for the attention paid to his former communication, asks that, in the interest of science, the Englishmen now in Egypt may determine the exact longitude of the centre of the Great Pyramid.

The longitude of the station of Mokattam Hills has been correctly determined by what is called the Venus Transit Measurement, fixed by a congress of all civilized nations in 1876 by telegraphic signals from Europe. The distance from this point to the Great Pyramid is very short, and any engineering officer who would obtain this unascertained information would render a lasting service to science.

MR. GLADSTONE'S REPLY.

10 DOWNING ST., WHITEHALL, Nov. 19, 1883.

Sir:—Mr. Gladstone has had the honor to receive the communication which you addressed to him the 21st ult., on the subject of the Great Pyramid in Egypt. In reply he desires me to say that in this country the Government rarely interferes directly in matters connected with scientific investigation; and therefore he does not see how he could himself further the object which you have in view. He suggests whether it might not be worth your while to communicate with the Royal Society or some other scientific body.

I am, sir, your obedient servant,

E. W. HAMILTON.

LETTER FROM WILLIAM B. WHITING.

824 Racine Street, Milwaukee, Wis., Oct., 29, 1883.

Dear Sir:—I take the following from a Milwaukee newspaper.

ROME, Oct. 24.—“The report of the Committee of the Geodetic Association was adopted by the meeting to-day after an animated debate. The report favors the universal adoption of the Greenwich meridian, and also recommends as the point of the departure of the universal hour and the cosmopolitan date the mean noon of Greenwich. The conference hopes that if the world agrees to the unification of the longitudes and the hours by accepting the Greenwich meridian, England will advance the unification of weights and measures by joining the Metrical Convention.”

If it is correct, the convention at Rome has made a double blunder. First, in recommending the meridian of Greenwich as a universal prime, it having no peculiar advantage over any other but that of usage only. The hydrographic office at Greenwich has amassed a greater amount of hydrographic information than any other, and published a greater amount of charts, thereby securing the majority of maritime use; and second in suggesting that England in acknowledgement of this adoption of Greenwich for a prime, join the metrical coalition.

I received some days since a notice of the meeting of your society to be held in Boston and also a notice of Lieutenant Totten's work on the Seal of the United States, to which I subscribed a long while since.

I take this opportunity to suggest that the establishment of an observatory at Fort Natal in South Africa would be nearly or quite on the meridian of the Pyramid of Ghizeh and, in conjunction with the observatory at St. Petersburg, would present a splendid

base of 90° of latitude for the determination of parallax and other astronomical phenomena.

Yours truly, WILLIAM B. WHITING,
Com., U. S. Navy.

LETTER FROM EDWIN WILMSHURST.

Dear Sir.—John Taylor has often dined in this house. His brothers' children are my most intimate friends here now. He worked his theory out of his "inner consciousness" *in re*. We are, in this age, passing through a most momentous crisis, and the struggle between old and new ideas will wreck the policy of most of the Old World nations. I believe the Anglo-Saxon race *alone* is fitted by the training of twenty centuries to assimilate the discoveries of modern science, with the revelation of the God of Abraham, and that a weighty confederation of *all* the branches of English speaking peoples, will ultimately dominate the planet and "lick creation." I don't know if you take any interest in these matters; but the study, many leisure hours of secular history alone has convinced me of the fact that we are the ultimate "Stone Kingdom" of Daniel. I remember when I was a boy of 14 hearing the verger at Westminster Abbey tell us that the "stone" in the coronation chair *was* Jacob's Pillow, and such is the firm belief popularly received.

Yours truly, EDWIN WILMSHURST.

LETTER FROM WILLIAM P. SHINN.

NEW YORK, 1883.

Dear Sir:—In the INTERNATIONAL STANDARD, page 57, reference is made to the number 5280 as having a large number of divisors (46), and in a note the editor says: "No number below 5280 has a larger number of integral divisors," etc. If this statement, if true, is taken to prove its fitness for the use referred to, then its untruth would logically prove its unfitness.

Try $2 \times 3 \times 4 \times 5 \times 6 \times 7 = 5040$ —a number less than 5280, which has 58 integral divisors, viz.:

2,	.	.	4,	.	5,	6,	.	7,	.	8,	.	9,	.	10,	.	12,	.	14,	.	15,	12	
X																						
16,	18,	.	20,	.	21,	.	24,	.	28,	.	30,	.	35,	.	36,	.	40,	.	42,	.	45,	12
X																						
48,	56,	.	60,	.	63,	.	70,	.	72,	.	X 80,	.	84,	.	90,	.	105,	.	112,	.	120,	12
.	.	X	.	.	168,	.	180,	.	210,	.	X 240,	.	252,	.	280,	.	315,	X	320,	.	360,	12
126,	140,	144,	168,	.	180,	.	210,	.	240,	.	X 252,	.	280,	.	315,	X	336,	360,	.	360,	12	
.	.	X	.	.	504,	.	560,	.	630,	.	X 720,	.	840,	X 1008,	1260,	X 1680,	2520,	.	360,	.	58	58

Pretty fair for a first trial. I am quite sure others can be found.

Yours truly, WILLIAM P. SHINN.

TREASURER'S REPORT, YEAR ENDING NOV. 8, 1883.

RECEIPTS.

By Balance—Last Statement:

International Institute.....	\$ 00 00	
Ohio Auxiliary Society.....	85 87	
	<hr/>	\$ 85 87
" Annual Dues:		
International Institute.....	331 47	
Ohio Auxiliary Society.....	316 60	
	<hr/>	648 07
" Life Membership Fees:		
International Institute.....	200 00	
Ohio Auxiliary Society.....	25 00	
	<hr/>	225 00
" Donations:		
International Institute.....	81 00	
Ohio Auxiliary Society.....	18 00	
	<hr/>	99 00
" Monthly Battalion:		
Ohio Auxiliary Society.....	8 00	
	<hr/>	8 00
" Sale of Magazines:		
International Institute.....	70	
Ohio Auxiliary Society.....	2 00	
	<hr/>	2 70
" Sale of Thermometers:		
Ohio Auxiliary Society.....	2 00	
	<hr/>	2 00
" Sale Photo of Isis:		
Ohio Auxiliary Society.....	50	
	<hr/>	50
" Cash Charles Latimer:		
International Institute.....	1027 52	
Ohio Auxiliary Society.....	286 00	
	<hr/>	1313 52
	<hr/>	\$2384 66

DISBURSEMENTS.

By Printing—

Magazine:		
International Institute.....	\$1097 38	
Ohio Auxiliary Society.....	57 00	
	<hr/>	\$1154 38
Pamphlets, &c.:		
International Institute.....	238 55	
	<hr/>	238 55
Newspapers:		
International Institute.....	32 00	
Ohio Auxiliary Society.....	39 64	
	<hr/>	71 64
Notices of Meetings, &c.:		
International Institute.....	19 75	
Ohio Auxiliary Society.....	58 80	
	<hr/>	78 55
	<hr/>	1543 12

Office Expenses—

Room Rent:

International Institute.....	\$ 50 00
Ohio Auxiliary Society.....	<u>87 50</u>
	\$137 50

Organ Rent:

Ohio Auxiliary Society.....	<u>36 00</u>
	36 00

Scales:

Ohio Auxiliary Society.....	<u>50 00</u>
	50 00

Weights:

Ohio Auxiliary Society.....	<u>18 00</u>
	18 00

Stamps, Express Charges, &c.:

International Institute.....	85 08
Ohio Auxiliary Society.....	<u>70 70</u>
	155 78

Salaries:

International Institute.....	110 00
Ohio Auxiliary Society.....	<u>291 50</u>
	401 50
	<u>798 78</u>
	\$2341 90

Balance on hand Nov. 8, 1883.....	<u> </u>	\$42 76
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SUMMARY.

International Institute.

Receipts.....	\$1648 69
Disbursements	1632 76
Balance.....	<u> </u>
	\$15 93

Ohio Auxiliary Society.

Receipts.....	735 97
Disbursements.....	709 14
Balance	<u> </u>
Total Cash on hand Nov. 8, 1883.....	<u> </u>
	\$42 76

STATEMENT—CASH ACCOUNT.

1879-1883.

1879 & 1880.

Receipts (estimated).....	\$1000 00
Disbursements (estimated).....	1000 00
Balance on hand Nov. 8, 1880.....	<u> </u>
1880 & 1881.	\$0000 00

Balance last Statement.....	\$ 000 00
Receipts.....	<u>3287 76</u>
Disbursements	3287 76
Balance on hand Nov. 8, 1881.....	<u> </u>
1881 & 1882.	\$2326 39

Balance last Statement.....	961 37
Receipts.....	<u>761 34</u>
Disbursements	761 34
Balance on hand Nov. 8, 1882.....	<u> </u>
1881 & 1882.	\$961 37

Balance last Statement.....	961 37
Receipts.....	<u>1722 71</u>
Disbursements	1722 71
Balance Nov. 8, 1882.....	<u> </u>
1881 & 1882.	\$85 87

1882 & 1883.	
Balance last Statement.....	85 87
Receipts.....	<u>2298 79</u>
Disbursements	2384 66
Balance Nov. 8, 1883.....	2341 90

	\$42 76
SUMMARY.	
Receipts (4 years).....	\$7347 89
Disbursements (4 years).....	7305 13
Balance Nov. 8, 1883.....	_____
	\$42 76

REVIEWS.

Since our last issue there has come to this country from abroad the book of Mr. William Flinders Petrie. It will be remembered that Mr. Petrie wrote to Mr. Cox, his letter having been published in one of the previous issues, informing us of new measures being taken at the Pyramid. If there has been one thing wanting more than another at the Pyramid it has been the particular and accurate measures of the base sockets. Professor C. Piazzi Smyth acknowledges this in his work, and was anxious that they should be more carefully measured. He had settled upon 9,140 inches as one certain base length. In a paper upon the British inch by Mr. Latimer, published in the proceedings of 1880, and in the "Banner of Israel," "The Heir of the World" and "Our Rest," he made the base line, as evolved from the interior, as 9,140 inches, confirming Professor Smyth's as a theoretical base. Mr. J. H. Dow, of Cleveland, Ohio, having examined the figures of Mr. Latimer, by his particular request, found that by a very slight alteration in the base, the whole structure would become a mathematical development. Hence he deduced the base of the Pyramid as $180A \div 2\sqrt{\pi}$ which gave 9139.871258+, which Mr. Latimer admitted was the proper one, having declared that his base of 9140 inches was evidently a slight amount in error.

Mr. Dow's formulæ will be found in No. 1 of the March Magazine, and we ask the readers to carefully examine his paper, and at the same time Mr. Latimer's diagram in the same number, also Mr. Searles' paper.

Mr. Petrie has certainly acquitted himself well in the task which he undertook, as regards his measures, and has verified with uncommon nicety the most of the measures of his predecessors, and has gone far beyond them in the measures of the base, and, judging from the tone of the opening sentences of his work, that his measures were the funeral of the theories concerning the Pyramid, one would suppose that his base length, differing, as it would seem, from that reached by Piazzi Smyth and others, was the true and unanswerable measure of the base; but Rev. H. G. Wood, of Sharon, Pennsylvania, whose paper is in the present number, has proven conclusively that Mr. Petrie's measures do not overthrow those of Piazzi Smyth, but prove the truth of his base length to a minute fraction, and overwhelmingly prove the truth presented by Messrs. Latimer and Dow in regard to the evolution of the base from the interior, giving $9,139.871258+$ inches for the lowest of the bases of the Pyramid shown by Petrie.

Whilst we admire and are delighted with the remarkable accuracy with which Mr. Petrie has done his work, we must regret the assumption of preeminence which he affects in his measures, by which he proposes to utterly overthrow many of the theories of his predecessors, and assumes to himself the right to start a lot of fresh ones. This lacks somewhat of modesty. After an examination of his work we are happy to say that he in no manner overturns or destroys any of the main, valuable theories that have been presented by Piazzi Smyth and others in relation to the scientific and astronomical or indeed the chronological aspect of the Great Stone Pillar, but, on the contrary, confirms them and unwittingly renders a great service to former theories so that their advocates feel as if they could take courage and march on with greater power and strength and earnestness than ever in the path which has been marked out for them.

The great variety of cubits presented by Mr. Petrie is a feature which attracts attention, and in all he does not seem to have caught the idea of Mr. J. Ralston Skinner, who was the first to show that the cubit of the Pyramid is nothing more nor less than a decimal of the number of seconds in the analytical

unit, or $20.62648+$ and which is the 10th of the King's Chamber width; and this cubit runs through the whole structure, showing its wonderful mathematical character. Inasmuch as Mr. Petrie does not seem to understand this question of cubits, naturally he would grope about, using first one and then another, none differing much more than a 10th of an inch from the true. Let the readers look in No. 1 Magazine and study the question there and they will see overwhelming evidence to prove the correctness of Mr. Dow's formulæ and that there is probably not more than two, viz.: 20.612 and $20.62648+$. The measures of the whole structure, in and out, prove this beyond controversy, we think; if not, we will be glad to have any one attack it. We are all seeking for the truth. We want the truth in soberness and in kindness to each other, and we want a fair, earnest, liberal, discussion, not acrimonious but always looking to the fact that we are studying a great monument of inspiration given by God for our instruction; and every seeker of the truth should act and speak and write as unto God.

"The True Key to Ancient Cosmology and Mythical Geography," by William F. Warren, S. S. D., L. L. D., President of Boston University, U. S. A. Third edition. 12mo.

Some symptom of the wealth of material knowledge intended to put Adamic man, created in the image of God, on a high level at the beginning of his career on this earth-ball but long sadly lost—is afforded by a little book recently published by Dr. Warren, principal of the Boston University, United States, wherein he explains away (and to the approval apparently of some high-class classics of both Oxford and Cambridge) the otherwise absurd account of Homer's Ulysses being seven years in reaching Ithaca from Troy, by the *Odyssey*, being really founded on an earlier account of the circumnavigation of the whole world; and so truly to what we know now to be the geography of it, that Ulysses' two occasions of descending to Tartarus were merely metaphors of his predecessors in sailing round the globe, having had twice to descend into very far southern latitudes in order to round both our Cape Horn and Cape of Good Hope.

THE TOWER OF EGYPT; OR, THE TYPES AND CHRONOLOGY OF THE GREAT PYRAMID.

We are indebted to Professor Piazzi Smyth for the above volume of 192 pages *duo-decimo*. Published by I. W. Partridge & Co., 9 Paternoster Row, London.

The author is A. G. R. He claims to have a new key for unlocking the chronology shown by the Great Pyramid and especially adapted to the Grand Gallery. He uses the Pyramid inch unit. He declares the Great Pyramid to be "a revelation"—scientific and sacred. He claims that Christ is the Alpha and the Omega of the Grand Gallery; that the floor stones are apostolic. The key applied to unlock the mysteries is mathematical, and the method of its use is urged with logic and power and not merely fanciful. It is worthy of attention, and examination by Pyramid students, and we must take it up and examine it. That the history of our race is written in this Stone Pillar has long been the belief of the writer of this notice, and he believes that Mr. Proctor wrote wiser than he knew when he said the building was astrological.

OUR REST AND SIGNS OF THE TIMES. A large, sixteen-page monthly, published by C. H. Jones, No. 138 Lake street, Chicago; London, England, W. H. Guest, Agent, No. 29 Paternoster Row.

OUR REST is strictly undenominational, but is a firm advocate of the inspiration of the Holy Scriptures, and of salvation only through faith in the atoning sacrifice of Christ, etc. It also advocates the pre-millennial advent of Christ; the resurrection of the dead and translation of the living saints; their subsequent reign with Christ, as kings and priests on the earth, and the coming of the time when "all shall know the Lord, from the least unto the greatest." The "Signs of the Times," as indicating the near approach of Christ's coming, occupy a liberal share of its columns. Terms, \$1.00 per annum.

EDITORIAL NOTES.

In justice to Mr. Charles Casey, Pollerton Castle, Carlow, Ireland, whose paper on "Pyramid Prophecies and Egyptian Events" appeared in the November number of this Magazine, we wish to say: The proof sheets of the paper containing Mr. Casey's corrections of and alterations from the original wording of the article were received too late to be made in the last issue of this Magazine; and, what is more to be regretted, cannot be completely made in this issue, for the reason that the publisher, into whose hands the amended proof sheets were placed, had the misfortune to mislay and lose them in moving his office. However, there occurred (page 310, ninth line from bottom) a serious error, which, happily, we are able to correct. The word "anity" is printed *insanity*. Some of the other emendations are important, and we greatly regret we cannot print them in full.

We present in this number portraits of John Taylor and Professor C. Piazzi Smyth. As the first likeness of John Taylor was faulty, we take pleasure in giving our subscribers an improved copy. We think it appropriate to place beside it the portrait of Professor C. Piazzi Smyth, who has so ably and grandly carried forward the work since the lamented death of his friend, John Taylor, of Gower street, London. We must state that the portrait has been placed in the Magazine without the sanction of Professor Smyth. It was procured through the kindness of a friend, and we trust that he will pardon the liberty we have taken, because of our great desire to show our readers the face of one who is dear to all Pyramid students through his writings and conscientious work.

This work of Mr. Bisbee's at the Foreign Exhibition has been a remarkably important one, especially so when it is considered that he has done almost all of this at his own expense without compensation, but for the love of the work, in the interests of which we are all striving. Mrs. S. W. Libby and Dr. Lawrence also have a full share of the praise, for they have likewise devoted much time and without compensation to the work of spreading the truth.

The first year of the INTERNATIONAL STANDARD closes with this number. As we have before stated, the Magazine is not yet self-supporting. It is to be hoped that members will consider the proposition of Mr. J. Ralston Skinner, who offers to be one of two hundred, each to furnish \$10 per annum for the maintenance of the publication. We are prepared to furnish bound volumes of the numbers published to all members who desire them.

One of our members has recently withdrawn from the Society on account of "our Masonic proclivities." The Society is neither Masonic nor anti-Masonic, and although it includes among its members a number of prominent Masons, it is not, as a body, responsible for the facts or opinions advanced by any of its members, as is stated on the title page.

Within a few weeks we have received many letters expressing the hope that the expedition to the Great Pyramid may soon be organized. An unusual interest has been awakened. One gentleman has offered to be one of ten, each to furnish \$10,000 for the expenses of the expedition. We feel confident that sooner or later the means will be provided.

We regret to say that a number of valuable papers and letters have been crowded out of this number, but will appear in our next.

ENQUIRERS' CLUB.

First—Custom Freemasonry, I understand, makes the foundation corner-stone of a building the northeast corner. Whence did this originate? Has it always been customary with Free Masons? Some think that Free Masons existed as an order at the building of the Great Pyramid. Have we not there the key of its origin? Does not the entrance passage point to the northeast corner-stone as the Jerusalem corner-stone and the corner-stone of the structure?

S. H. REEVE.

Second—with reference to the pamphlet, "The Earth's Aqueous Ring; or, the Deluge and Its Cause," a correspondent asks: "Why should there be no rainbow before the Deluge?" "When the last belt of vapors descended with the atmosphere at the equator, it necessarily *spread out* in its efforts to fall where the centrifugal force of the atmosphere was naught, or at the poles. Thus a great canopy of vapor intercepted the sun's direct light and heat. For every 27° that the temperature of the air is raised, its capacity for absorbing and containing moisture is increased one hundred per cent. Thus, in antediluvian times, when the sun was overhead, its light and heat were diffused throughout the mass of atmosphere and vapor, which, of necessity, *was warmer*. But when the sun retired to the opposite side of the earth, this atmosphere, becoming cooler, of necessity deposited a part of its load of vapors or mists. By this mist the earth was watered during the Adamite age."

ISAAC N. VAIL.

Third—"Upon first reading the Granite Coffin, I was strongly impressed with the idea that it typified the resurrection of Christ. What could more fitly represent the 'heart of the earth' than the inmost depths of the vast Pyramid, which is said to represent the earth in many ways? When the Saviour, freed from his tomb, rose into the glorious realm of eternal light, perhaps he left behind a memorial of it, and its important *emptiness* in the form of the coverless coffin. All pyramid students are familiar with the theory that the chief cap-stone of the Pyramid of Ghizeh, which is lacking at the present time, represents the Saviour's departure from the earth. The empty coffin and the missing cap-stone, do they not both tell of the absent Lord?" *Veri Surrexit.*

Fourth—I have been informed that if the Pyramid was made the zero, or first meridian, it would be two hours and five minutes from Greenwich. Is this exactly the fact?

S. F. G.

Many additional letters of great interest have been received, but lack of space prevents our giving them in full. Mr. J. L. Dampier, of London, Canada, contributes some thoughtful papers upon the subjects of "Coming Events," the "Identity," etc. We hope to give an account of these at some future time.

Mrs. A. E. Gates, Chicago, writes: "To get unrecognized truths and facts before the people attractively and convincingly, is what I am sanguine this Magazine will do. We are naturally so conservative we do not take kindly to new beliefs, interpretations, nor revelations. It will take time and deliberation to decide what is wisest in this matter of weights and measures, and a further unveiling of the mysteries of the Pyramid will be necessary."

Lieut. George H. Felt says: "I am glad to see that there is an organized protest against the French metric system. The English inch is the standard of measure in nature, as shown in Egyptian construction and Greek art. Twenty-eight inches (one royal cubit) and eighty-four inches (three royal cubits and four common cubits) and multiples and subdivisions of these measures are found all through their constructions."

Mrs. Moses Hill, of Kalamazoo, Mich., writes: "The Ladies Library Club, of Kalamazoo, have been studying Egypt during the last year, and have given much attention to the Great Pyramid of Ghizeh. It appears that we are just in the shadowy twilight of its wonderful revealings. I believe that the "Granite Leaf" contains a solution of this mystery of the ages. I was glad to learn that the Institute is agitating the question of appointing a commission to visit Egypt to investigate its wonders."

Walton W. Evans, C. E., states that some years ago, at the Institution of Civil Engineers in England, the adoption of a new guage for railways in India was discussed. A number of members advocated the metric guage, but old George Bidder rose and said: "I suppose you advocate a metric guage because you think there is something in it that sounds scientific. They did adopt it, and after building five thousand miles of 5'. 6" guage, found that they had "jumped out of the frying pan into the fire," and within two years abandoned the metre.

Theodore Fabor, of Brooklyn, writes: "What is the criterion of mathematical truth? According to my own finding it consists in harmony between measure and number; and where, in any problem, that harmony is lacking, there truth is lacking."

Theodore Gribi, of Elgin, Ill., says: "I enclose you a report of the Geodetic Conference at Rome. It reveals the real reason why this European conference was ready to adopt the meridian of Greenwich as prime meridian, viz.: as a stratagem to flatter England into joining the metric league. And I recognize this sly movement as the style of my friend, Dr. Hirsch. I know he is at the bottom of all this. No one knows better how to win his opponents over to his cause, and I would not be surprised if England, so far as the ruling party is concerned, would fall easily into the snare."

Letters have also been received from Lucian I. Bisbee, Secretary of the International Institute, Boston; J. P. Weethee, Millfield, O.; F. G. Williams, Arlee, Montana; Rev. M. L. Streator, Helena, Montana; Joshua Douglass, Meadville, Pa.; Adjutant W. K. McAlister, Garden City, L. I.; Victor H. Ernst, Jersey City; George M. Howells, Flushing, N. Y.; Professor I. N. Vail, Barnesville, O.; W. A. Sweet, Syracuse, N. Y.; Professor E. R. Graham, Fairville, Mo.; W. J. Spicer, Montreal, Canada; Hon. John B. Jervis, Rome, N.Y.; Rev. E. P. Adams, Dunkirk, N.Y.; Rev. E. P. Ingersoll, Rosevale, Kansas; J. Nehab, Ph. D. St. Paul's School, Garden City; S. F. Gates, Cambridgeport, and several other members whose communications will be noticed in our next issue.

OBITUARY.

REV. LUCIUS H. BUGBEE, D. D.

Among the honored dead of the past year no one is more regretted than the late president of Allegheny College, Meadville, Pa., Dr. Lucius H. Bugbee, a member of our Society, and our friend. He died on Saturday morning, July 28th, at Clifton Springs, New York.

RALPH P. LOWE.

We have just received intelligence of the death of our faithful friend and valued member, Ralph P. Lowe, ex-Governor of Iowa. The last letter received from him, published in our November number, evinces the deep interest he felt in the objects of our Institute. In it he strongly urges the organization of a commission to make an extensive examination of the secrets and mysteries of the Pyramid of Ghizeh. Though we were touched by the earnest spirit manifested in his letter, we did not feel its full significance till we knew that it contained the last message to us of a dying man. Apparently his desire will be fulfilled.

ERRATA.

We have received the following communication from Mrs. Piazz Smyth:

In correction and corroboration of the short notice in your last number of the late excellent Major-General Howard Vyse, will you kindly insert in your next number the following extract from a letter I received from his son, the present Colonel Howard Vyse?—

"I am sure," says he, "you will excuse my pointing out one or two small errors in the account of his birth and life, copied from the one I sent you. It should be Lady Lucy, not Lady *Mary* Howard, daughter of the Earl of Strafford, not *Stafford*, and of Wentworth, not *Wentworte* Castle.

My father was a most just man and a very religious one. I believe that there have been few laymen who were more thoroughly acquainted with the Bible in all its aspects. He was devoted to England, and was a true English gentleman of the Old School, a type, unfortunately, nearly extinct in these days of so-called civilization."

Page 387—In letter from Mrs. E. Bedell Benjamin, for Tavist, *read* Taoist.

Page 388—For "rectrico of the Pyramid" *read* rectrice, meaning Lady Rector; or, Governess of the Pyramid.

Page 390—In letter from Professor Asahel Abbott, for Mugh Beigh, *read* Ulugh Beigh.

Page 392—In letter from J. L. Dampier, sentence beginning on 4th line should be: "Some *very learned* men (Goths, vandals iconoclasts, appropriate epithets for them) recently endeavored to overthrow our cherished myths of Greece and Rome, but offered naught in return.

Page 414—In Dr. J. W. Redfield's paper, this issue, 5th line from bottom, there should be a period instead of a comma after the word *Jerusalem*, and in the line following, after the word *Israel* there should be a period instead of an interrogation point.